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### Improved "Dead-center Lift."

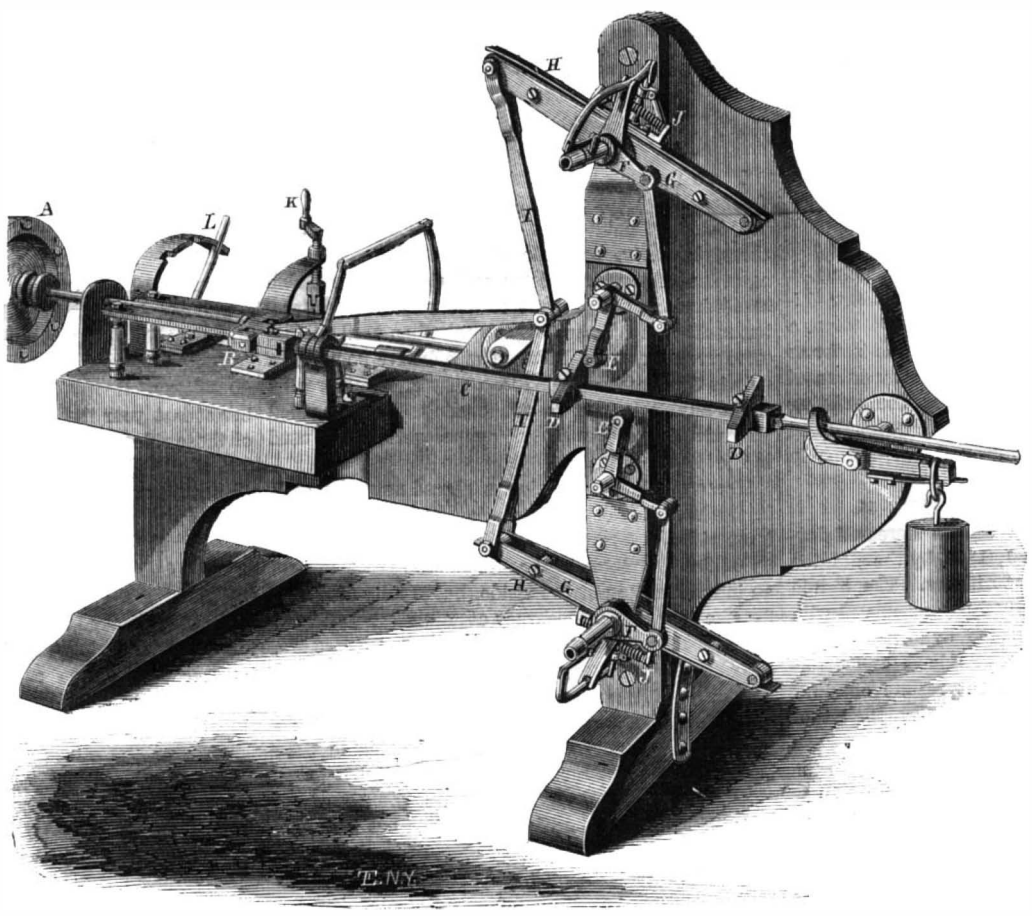
This machine is intended to lift the cranks of steam engines over their centers. We append the inventor's description:—

"The great danger to life and property caused by the cranks of steam engines stopping on the dead centers, is well known to every practical engineer. Steamboats, when about to make a landing, have been seriously injured by the crank getting on the dead center, thereby making it utterly impossible for the engineer to manage the boat. Before men can be called from their various occupations to go to the wheel, or get a lever and force the crank over, many very serious and oftentimes fatal accidents occur, since the most careful engineer cannot prevent the difficulty from frequently occurring. The invention called the Dead-center Lift, which I have patented in the United States and Great Britain, renders it utterly impossible for this difficulty to happen. By a simple mechanical arrangement a sufficient amount of power is stored up to take the crank over, it being at all times under the control of steam. There is another advantage in my invention which renders it especially valuable to steamboat engines and other machinery, which is, in economising the power lost by friction on the crank when the machinery motion is comparatively slow."

The following description will render the principal details of this invention clear to all. The cylinder, A, has a piston and rod as usual; to the latter a crosshead, B, is connected whereto the rod, C, is attached. This rod works through guides and has tappets, D, which strike the levers, E, when the engine is at work. As these levers move they act on the arms, F, which in turn causes the beam, G, to vibrate on its axis. At the backs of these beams there are springs, H, which exert a downward pressure upon the beam. When one end of the upper beam is depressed the force of the spring bears upon the upper end, which force, being transmitted through the link, I, acts directly on the pin of the crank when the same is on the center or dead point. This action always takes place alternately, above and below the pin, when the engine is at work.

There is an arrangement on the beam, G, by which the springs can be tightened or rendered stiffer as they "set" from continuous action. This is effected by causing the slides, J, to move out toward the ends of the beams; it can be done at any time when the engine runs by turning the handle, K. The action of the engine can be reversed by turning the tappet shaft over with the lever, L. The inventor of this device is desirous of introducing it in public service.

It is patented in England, France and Belgium, through the Scientific American Patent Agency, on the 9th of August, 1864, by Jas. J. Gorman. For further particulars address him at No. 20 New street, Cincinnati, Ohio.




GORMAN'S "DEAD-CENTER LIFT."

### Coal Mining Invention.

Mr. James Westerman, of Sharon, Pa., and Mr. John S. Furks, of Meadville, Pa., the latter formerly a citizen of Cuyahoga County, Ohio, and latterly master mechanic with Van Brocklan, Jones & Ward, Youngstown, Ohio, have invented a machine for mining coal. The machine is simple in its structure, and consists of a small carriage mounted upon trucks, upon which is mounted a circular saw with a self-feeding attachment, arranged upon an upright shaft for the purpose of doing the "bearing in," as the miners term it, and to be propelled either by horse power, or by an engine driven by compressed air, by which means they accomplish the two-fold purpose of mining the coal and freeing the bank from all impure air. These gentlemen have been experimenting with saws with a view to mining for nearly a year, and as both of them are practical men and know well what is required, we have the fullest confidence in the success of their invention.

### Utilisation of Small Coal.

Some few months since reference was made to an invention of Mr. Arthur Wall, from which he anticipated an extraordinary economy in the use of fuel both in connection with the manufacture of iron and in the generation of steam; and although the importance of the invention seems to have been somewhat exaggerated, it appears from the specification of he patent, which has now been published, that the suggestion might be turned to account in the rendering marketable of the enormous quantities of small coal now wasted at the pit's mouth. Mr. Wall's invention consists in combining (for use as fuel for steam-ships, locomotives, stationary engines, and domestic purposes, or otherwise) of the various bodies herein specified, by intimately mixing them together with other materials herein mentioned, and compressing the compound substance so obtained into masses or blocks of forms and sizes suitable for burning in furnaces of any description, so as to raise steam for land or marine boilers, or for use for domestic or other purposes. To effect this, he takes oils or oleaginous matter, whether animal, vegetable, or mineral, crude or refined Canada oil (commonly called petroleum or rock oil), paraffine, and mixes these bodies or substances, or any of them with pitch, tar, resin, or turpentine, or the refuse of these substances, turf, moss, or peat, and either singly or together combines them with sawdust or shavings, or other debris of wood or woody substances finely comminuted, and the substance so obtained he mixes with coal, coal dust, or slack, coke or cinders ground to powder or sifted fine, and when intimately mixed and ground together he passes them through a press and compresses them, when they are fit for use. When any combination is intended for steam purposes, whether for land or marine boilers, the best quality should be supplied, but for domestic purposes several qualities inferior thereto may be used with advantage. Mr. Wall considers that the mixed fuel, being composed of hydrogenous and carboniferous bodies, forms a kind of voltaic pile—the hydrogenous bodies constituting the positive pole, and the coal, cinders, &c., the negative pole. As his positive and negative elements are all finely divided, intimately mixed together—the carbonaceous matters being pulverised and kneaded with the oils which are to supply the hydrogen—and compressed, they are likely to act very nicely. He claims that his fuel, from its being formed of nearly pure hydrocarbons, will be found to consume its own smoke, and any that may arise from any other fuel that may be in contact or burned with it, besides yielding an astonishing amount of light and heat.—*London Mining Journal.*

### Jacob's Wheel Working Machinery.

It was stated in our article accompanying the recent illustration of this ingenious machinery that the *entire* patents were for sale. This is incorrect. The *foreign* patents only are for sale, the company being now engaged actively in working their invention in this country.

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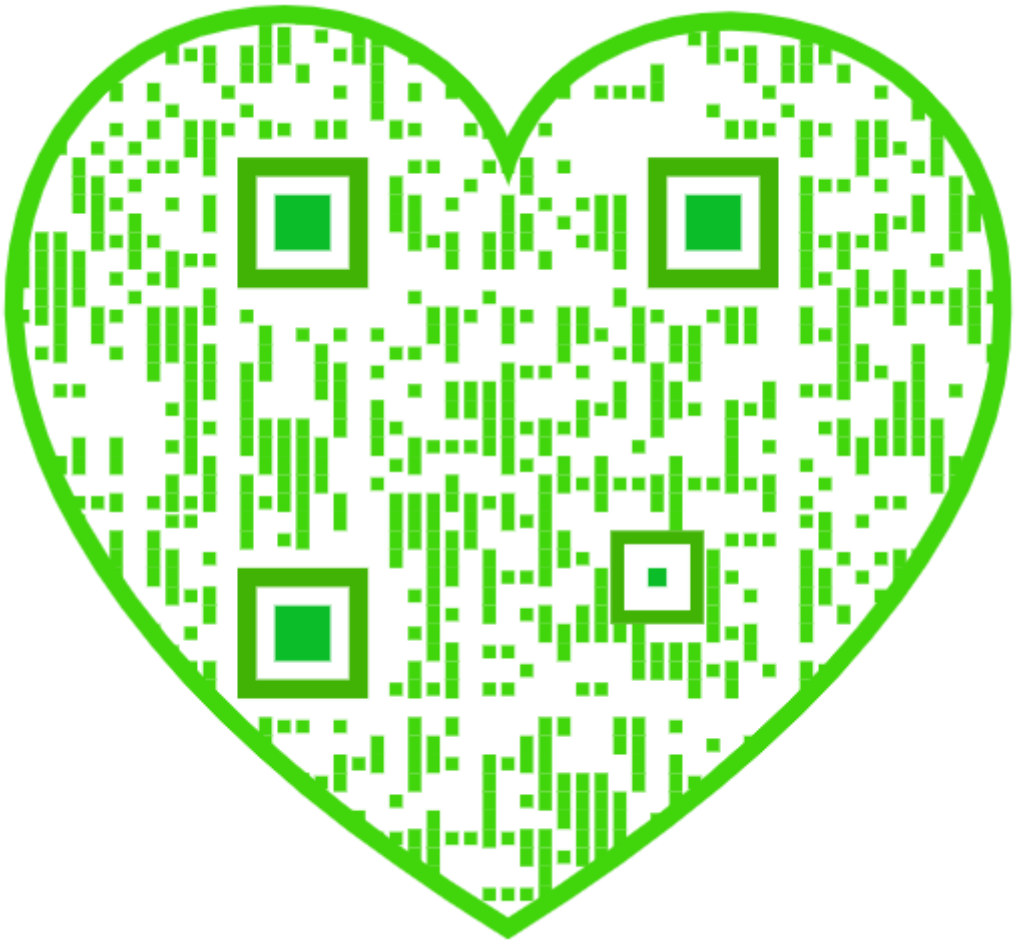

## THE PLANTS AND ANIMALS OF THE PETROLEUM ROCKS.

[For the Scientific American ]

I have been to considerable labor to glean from numerous publications, both American and foreign, a complete list of all American vegetables and animals that lived in the latter part of the Devonian age of the world, an age which we may now emphatically call the oil age, preceding the coal age. I think it to be as perfect as can now be made out. It shows the large amount of material which then existed for the generation of petroleum, and when we remember that it is only the few species of the many that are petrified, and thus preserved—petrification being the exception and decay the general rule—we are surprised at the number of genera and species. The individuals are found by myriads, many feet of strata being filled with them.

TABLE OF UPPER DEVONIAN FAUNA AND FLORA.

| | Plants. | Corals. | Bryozoa. | Echinoderms. | Molluscs. | Crustacea. | Fish. | Reptiles. |
|---|---|---|---|---|---|---|---|---|
| Genera..... | 42 | 16 | 6 | 25 | 106 | 3 | 8 | 1 |
| Species..... | 100 | 29 | 10 | 71 | 479 | 31 | 16 | 1 |

Of the plants, 3 genera and 5 species were sea weeds, the rest were land plants. R. P. STEVENS,

No. 244 Canal street, New York.

Dec. 20, 1864.

## REPORT OF THE CHIEF OF THE BUREAU OF ORDNANCE.

H. A. Wise, the efficient Chief of the Bureau of Ordnance, Navy Department, has made a report of the transactions in the several branches of his department, and we extract from the printed documents the subjoined matter. It will be found highly interesting and instructive:—

The method adopted in my last annual report of dividing it into separate headings, and treating of each subject in its distinctive character, being in many respects advantageous, I have therefore followed it in the present report. It thus becomes a *resume* of the last, and, in connection with it, forms an historical record of the important part performed by the navy ordnance in suppressing the existing rebellion, and indicates the vast power at hand, and in course of preparation, for our national defence in the future.

### THE ORDNANCE OF THE NAVY—1863–64.

The grand total of cannon has been increased during the year ending on Nov. 1, 1864, by the addition of 1,522 guns of the different calibers. The loss in guns sustained by the navy is trifling compared with the value of the services rendered by it not only in guarding our extended sea-coasts, bays and rivershores, but also in the magnificent results obtained in battle. Few guns have been surrendered or abandoned to the enemy; nearly all the losses have been by the inevitable accidents of battle, as in the case of the *Tecumseh* and *Commodore Jones*.

To the total on hand there should be added seven 10-inch solid-shot guns, intended for heavy work against iron plating, and three 13-inch Dahlgren guns, originally designed for the Monitor turrets, but superseded by the modifications made in the length and thickness, at muzzle, of the 15-inch guns, thereby adapting them to the use of a smaller port-hole.

There are also now in process of fabrication a new class of 32-pounders and 8-inch smooth-bore guns, for the broadsides of light vessels that are unable to carry and work efficiently the 9-inch shell guns. It is likewise in contemplation to provide for such vessels a new 8-inch solid-shot gun, to bear a heavy charge, in order to obtain greater penetration. The first gun of this kind has been cast, and will soon be subjected to regular experiment, the details of which are necessarily confined to the projection of a solid globe of hard iron or steel against a sample of any ordinary plating which can be used for the protection of vessels.

In the rifled ordnance adopted for naval purposes by the Bureau, no changes have been made, except in the introduction of one more caliber among the Parrott rifles, viz:—the 60-pounder. This, as an intermediate between the 30 and 100-pounder, has been found to be of great service as a chase gun, and fully supplies the place, in the armament of ships, contemplated by the 50-pounder of Rear-Admiral Dahlgren's system. It is generally used as a pivot gun, and, as its bore corresponds with that of the army smooth-bore 18-pounder, the round projectile of the latter is always available where high velocities are needed at close range.

### COMPOSITION OF BATTERIES.

The governing rule in arming our ships of war, has been to place on board of them the very heaviest and most effective guns they can bear with safety. In general it may be stated that the 9-inch are used for broadside, the 10-inch and 11-inch, and the Parrott rifles in pivot, the 15-inch for the monitor turrets, and the bronze howitzers and rifles for boat and deck service inshore. A few of our ships continue to be armed with the 32-pounder and 8-inch guns of the old system; but these will probably give way to the modified guns of similar classes above alluded to. The battery of a "first rate" is represented by the *Minnesota*, carrying one 150-pounder rifled and one 11-inch smooth, in pivot; forty-two 9-inch smooth, four 100-pounders rifled and four howitzers, in broadside.

Of the Monitors, by the *Tonawanda*, carrying four 15-inch, the *Onondaga*, carrying two 15-inch, two 150-pounders; and *Montauk*, carrying one 15-inch, one 150-pounder.

The development of the power of each individual ship is:—

| | In shot. lbs. | In shell. lbs. |
|---|---|---|
| 1st Rate..... | 2,606 | 2,123 |
| 2d Rate..... | 1,220 | 990 |
| 3d Rate..... | 424 | 343 |
| 4th Rate..... | 210 | 183 |
| and..... | 294 | 255 |
| In the Monitors:— | | |
| *Tonawanda*..... | 1,764 | 1,320 |
| *Onondaga*..... | 1,180 | 930 |
| *Montauk*..... | 606 | 465 |

These figures express the weight of metal thrown for breaching purposes by the guns at a single broadside in solid shot or shells. Conjoined with these, however, are the destructive and terrible agencies of grape, canister and shrapnel, available at all times in the general course of naval warfare, but most especially and signally so when used against uncovered masses of men. The effective power of a ship is therefore increased in a very great degree by these auxiliaries, which are common to both rifled and smooth bores, excepting grape, which is not used in the rifles.

These pivot guns are always placed near the ends in the vessel, and, therefore, do not interfere in the least with the working of the broadside. The rapidity of fire from them is of course not so great as from an individual gun of broadside, but is fully sufficient for the purpose of accuracy at ranges beyond the reach of the lesser calibers. No ship can, therefore, be considered properly armed that has not a pivot gun of greater power and range than the guns of broadside. But whether a battery consisting entirely of heavy pivot guns would be more formidable than one of broadside alone, the aggregate weights being equal, has not yet been tried, the only effort of the kind being that of the *Niagara*, which has a battery of twelve 150-pounder rifles mounted in pivot, and no regular broadside guns.

The decisive power of the heavy gun in pivot is, however, most strikingly exemplified in the recent fight between the *Kearsarge* and *Alabama*, although the distance at which the action was fought was fully within the scope of the broadside 32-pounders of either vessel, being only about 700 yards. The water also was smooth, and both ships moved steadily under steam in a continuous circle around a common center. Every condition was therefore most favorable for the full exercise of the offensive power of each class and description of gun used; but it does not appear from the official reports, or the published statements of the affair, that much damage was inflicted on either vessel by the guns of broadside, the decisive work having been performed only by the pivot guns of the *Kearsarge*. These were the two 11-inch guns mounted at either end of the ship, the light 30-pounder being too feeble to have had any bearing whatever upon the result.

We gather from the official report of Capt. Semmes of the *Alabama*, that the effect of the 11-inch shells of the *Kearsarge* was most disastrous. For he states that "after the lapse of about one hour and ten minutes our (his) ship was ascertained to be in a sinking condition, the enemy's shell having exploded in our sides and between decks, opening large apertures, through which the water rushed with great rapidity." This part of his report is most certainly true, if all the rest is questionable.

There can be no question with regard to the superiority of the 11-inch guns over the Blakely 120-pounder, and the 68-pounder of the English pivot system, either in penetration, smashing effect of the shot, or explosive power of the shells. For the *Alabama* was sunk in a little more than an hour after the *Kearsarge* began firing, and the English and French Navies were thus taught a lesson in practical gunnery and seamanship which they will not soon forget.

The result of this action may, therefore, be taken as proving, beyond doubt, the wisdom of arming our ships with a mixed battery of pivot and broadside guns, taking due care to place on board of each ship the heaviest and most powerful guns that she can safely carry, and manage with ease, in all weathers. This seems to have been fully and immediately understood by the officers of the French Navy at Cherbourg, who did not fail to avail themselves of the opportunity thus afforded them of studying the details of armament on board the *Kearsarge*, upon her return to that port after the battle. They are entirely welcome to the information thus obtained; the lesson is merely elementary, and by no means so instructive as the one since presented, for the world's investigation, on the waters of Mobile Bay.

### THE FOUNDERIES.

It is no idle boast that the cannon of the United States navy, made exclusively from American irons, are unsurpassed by those of any other nation; and this will continue to be the case so long as the enterprise of our citizens is left untrammeled, and full opportunities are afforded for the exercise of their skill in this most important art. The work has been steadily prosecuted during the past year, and will be continued by the founderies as fast as the demand for the smooth-bores increases.

The cast-iron banded rifles of Mr. Parrott, made at the West Point Foundery, are still the only kind used in the navy, except the bronze 12-pounders and 20-pounders of Rear-Admiral Dahlgren. Since November of last year there have been added to the stock of these rifles on hand at the depots and in service 385 of the different calibers, including twenty new 60-pounders, making a total at present available of 1,005 guns, after deducting twenty-three lost or disabled by the accidents of battle. Of these thus lost or disabled, six gave way at the breech, four were broken by the explosion of shells near the muzzle, three were cracked in the body, two were condemned for excessive enlargement of vent, seven were lost by wreck, and three captured by the rebels. The percentage of loss by rupture and enlargement is therefore very small.

### EXCELLENCE OF THE PARROTT GUN.

It may be remarked that no rifled gun has yet been devised which can be considered perfect; and the Bureau has sought in vain among the systems of European nations and the improvements of our own country for a better gun, taken as a whole, than the Parrott rifle. Its lifetime, as fixed by the inventor, is 750 rounds; but the navy guns have in many instances shown a greater endurance.

It is true that reports are occasionally received of failures with the Parrott projectiles (also prepared at the West Point Foundery), but these are again counterbalanced by the most favorable reports; and it is certain that whenever a close attention is paid to details in loading and firing, these guns may be relied upon for range and accuracy. But if these details, from any cause, are not sufficiently attended to, the firing of no rifled gun can be considered safe or certain. At all events, whatever may be the defects of the Parrott system of rifled ordnance, no other has yet been produced which commends itself so strongly to the service; and until another and a better one is devised and subjected to the same ordeal, the Bureau will continue to place its guns in the batteries of ships as important auxiliaries to the smooth-bore pivots.

The rule of the navy is to pay particular attention to the wear of the bores and vents, and to the manner of loading, especially in batteries established on shore.

### WROUGHT-IRON GUNS.

Propositions have been made to supersede cast-iron for rifles (and in fact for smooth bores also) by

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wrought-iron; and a heavy wrought-iron rifled gun of 7-inch bore, forged in a peculiar manner, by Mr. Horatio Ames, of Connecticut, is even now under process of trial, as well as one (of smooth bore) designed and constructed by our distinguished citizen, Mr. John Ericsson. But the experiments have not been sufficiently advanced with either of these guns to form a reliable judgment as to the probable result; for there are many grave questions involved besides the ability to resist rupture; and these will inevitably be developed under the strain of excessive charges.

PARROTT GUNS TO BE CAST ON RODMAN'S PLAN.

It may be remarked that Mr. Parrott has recently determined to manufacture his heavy rifles on the Rodman plan, being convinced that he thereby obtains a gun of greater uniform strength and density, with a surface of bore better suited to resist the action of the rifled projectiles.

It would no doubt be interesting to describe fully the process of founding cannon by both methods; but the limits of a general official report on various other subjects rendered this inexpedient. It is sufficient to know, however, that they are each perfectly understood by the men engaged in the business; and since the casting of the enormous 20-inch cannon at Fort Pitt Foundry for the Army and Navy, there really would seem to be no limit to the ambition and daring of our artisans. These huge masses of iron were cast without the slightest difficulty, the time elapsing from the moment of tapping the furnaces to the complete filling of the mold of the army gun, being only twenty-two minutes. To produce this casting, no less than one hundred and five tuns of iron were melted!

### American Trade in China.

The Shanghae correspondent of the London *Times* gives some highly interesting details of the rapidly increasing value of the trade with China, consequent upon the opening up to commerce of some of the great interior rivers. Not the least interesting among them, nor the least astonishing in the result it discloses, is that relating to Hankow, which was visited for the first time by Lord Elgin only six years since. The total value of the trade at this river-line port the past year, was between seven and eight millions sterling, or between thirty-five and forty millions of dollars. This large traffic employs a number of vessels, principally steamers, in carriage, and on this point, says the correspondent, American enterprise outstrips British, as the number of ships plying on the river which fly the stars and stripes is nearly double those which boast the union jack. The total inward tunnage of every description entered at the port of Hankow during the past year was 191,126 tuns, and of outward ships 204,185. Of this, in the aggregate 103,000 was British, 270,000 American and 3,517 (!) French. Out of this latter total 2,367 tuns were represented by native junks sailing under French protection, leaving 1,150 tuns represented by seven small lorchas, purely French.

### Agricultural Crops of the Country.

The Bimonthly Report of the Agricultural Department for September and October, 1864, gives the following estimates of the crops in twenty-one of the loyal States and Nebraska Territory, for the years 1862, 1863, 1864. The quantities are given in bushels, with the exception of tobacco, which is in pounds, and hay, which is in tuns:—

| | 1862. | 1863. | 1864. |
|---|---|---|---|
| Wheat | 181,188,089 | 179,404,036 | 160,695,823 |
| Rye | 21,239,451 | 20,782,782 | 19,872,975 |
| Barley | 12,488,022 | 11,467,155 | 10,716,328 |
| Oats | 171,463,405 | 173,800,575 | 176,690,064 |
| Corn | 586,226,305 | 451,967,959 | 530,581,403 |
| Tobacco | 136,751,746 | 267,267,920 | 197,468,229 |
| Buckwheat | 18,708,145 | 15,806,455 | 18,700,540 |
| Potatoes | 113,234,644 | 100,158,670 | 96,256,888 |
| Hay | 20,257,968 | 19,736,847 | 18,116,751 |

### Straw Protection for Bee-hives.

Take a few bundles of straw, open, sprinkle, and turn them. When so moist that they will not break in handling, grasp a handful by the buts and draw it out; take the heads in the other hand, and drop the buts; a little shake will separate all the short and broken straws, leaving only straight and long ones in the handful. Proceed in this way until you have a good bundle of long straw. Put a tight band about it very close to the heads. Twist some yards of rope from the broken straw. Now open the bundle and put it over the hive, spreading it evenly on all sides, and passing the rope tightly twice or thrice about it just above the fly hole. Then, with a knife or shears trim off the straws in a neat arc close around the hole, which should be so closed that only one or two bees can pass at a time. Ventilation ought to be provided before the straw is put on, and this is easily done in hives where the honey boxes are on the top, by taking them out and either leaving the holes open, or better, laying a bit of wire gauze over the holes. Thus protected, only very weak stocks fail to winter well, and such you cannot depend upon either to live or die.—*American Agriculturist.*

### Trades Unions and Strikes.

Miss Martineau, in her valuable "History of the Peace," has, in the introduction to the American edition lately issued by Walker, Wise & Co., given her judgment on Trades' Unions. As Miss Martineau is one of the prominent liberals of England, and has all her life been known as an earnest and intelligent friend of the working classes, her opinions are entitled to great weight. It will be seen, in the following extract, that the point she makes is the tyranny exercised over workmen by a few of their fellow workmen. She does not object to the right of each man to refuse to work unless he is paid the wages which he conceives his work to be worth, but to his right to compel others to adopt his own standard of wages. The passage, coming from such a source, is worthy the attention of all laborers, no matter what their occupation:—

"The ground of fear is that popular liberty is overborne by the Trades' Unions of our days. It seems to be so in every country where such combinations can take place; and the anxious questions are the same in all cases; the questions how to protect the liberties of individual workers against the dictation and tyranny of leaders and pretenders of their own class; and what are the chances of the class becoming informed and enlightened in regard to their legal and constitutional liberties in time to check the spirit of despotism in the few, and animate that of peaceful resistance to oppression in the many. At present, the Trades' Unions of the United Kingdom are its greatest apparent danger. They are an *Imperium in Imperio*, in which insufferable tyranny is exercised by working men over their fellows, from which there seems to be no escape but by the gradual process of education. The laws provide protection and remedy; but recourse to that protection is prevented by the same oppression. It is remarkable that the one intolerable despotism which at this day exists in England is found, not in the Government, not in the land-owners, not in the old-fashioned rural districts, but in the modern Democratic towns,—the despotism of working-men over fellow-workers in their own class and their own trade."

### Extraordinary Discoveries of Petroleum in California.

"The occurrence of fluid inflammable substances upon the coast of Santa Barbara, in Southern California, has been known since 1792; but little importance has been attached to it until very recently, when the development of the oil region of Pennsylvania has shown the immense value of the great natural repositories of petroleum, and directed attention to other localities in which it is found. One of the most extraordinary of these repositories is that near the coast of California, about three hundred and twenty miles south from San Francisco, where the usual indications of petroleum were so great that parties, on learning the fact, at once proceeded to make explorations.

"The importance of these indications of a great petroleum region was not appreciated by the early explorers and settlers in California from the Atlantic States; and none suspected that the oil of this district was destined to add another product to the resources of the State, unequaled, perhaps, in value even by that of her wonderful mines of the precious metals. Even the indications of the vast quantities of petroleum on the surface have been regarded by the owners of the estates as a detriment to their property, inasmuch as they caused a loss of their live stock, in which the value of their ranches chiefly consisted, by the animals becoming drowned in the great pools of petroleum. These exudations have the effect to render barren tracts of land of a mile square, more or less, in the midst of a fine agricultural district.

"The first attempt to apply this petroleum to useful purposes was made about two years since by Mr. Gilbert, who, understanding its nature, and finding it in abundance issuing from many springs upon the property, put up for himself a refinery upon a small scale. He drew the crude oil chiefly from one of the great wells, from which he obtained 400 barrels, without apparently diminishing the supply. In the summer of 1864 Prof. Silliman examined this locality, and in a letter, dated at Buenaventura, Santa Barbara County, July 2, 1864, he writes:—

"'The property covers an area of 18,000 acres in one body, on which are at present at least twenty natural oil wells, some of them of the largest size. The oil is struggling to the surface at every available point, and is running away down the rivers for miles and miles. Artesian wells will be fruitful along a double line of thirteen miles, say, for at least twenty-five miles in linear extent. The ranch is an old Spanish grant, of four leagues of land, lately confirmed, and of perfect title. It has, as I said, about 18,000 acres in it of the finest land, watered by four rivers, and measuring in a right line in all near thirteen miles. As a ranch it is a splendid estate, but its value is its almost fabulous wealth in the best of oil.'"

### The Cotton Supply Restored.

In the circular issued to the cotton dealers of England by Messrs. Neil Brothers is this paragraph:—

Cotton trade writers generally still industriously keep up the notion that the course of prices of this staple depends upon American politics and the state of the money market, studiously ignoring the fact demonstrated by the figures given below that, owing to the increased supplies from all quarters on the one hand, and the permanent decline of demand from economizing of material and substitution of other fibers for clothing on the other hand, our supplies of cotton, independently of America, are now in excess of the requirements.

They also give the following table:—

Supplies of cotton to the United Kingdom from other countries than the United States, but including latterly small receipts of American cotton from Matamoras and through the blockade:—

| | Bales. |
|---|---|
| 1858 | 577,000 |
| 1859 | 744,000 |
| 1860 | 784,000 |
| 1861 | 1,194,000 |
| 1862 | 1,445,000 |
| 1863 | 1,932,000 |
| 1864 | 2,600,000 |
| 1865 (estimated) | 3,500,000 |

| | *Stocks of Cotton* 1863 Bales. | *Dec. 2.* 1864 Bales. |
|---|---|---|
| At Liverpool | 249,509 | 383,800 |
| At London | 43,500 | 117,700 |
| At Havre | 26,200 | 61,800 |
| Total | 319,200 | 563,300 |
| | | 319,200 |
| Increase of stock in 12 months | | 244,100 |

### Petroleum for Raising Steam.

An elementary course of experiments was commenced last week in the factory department of Woolwich dockyard, with a view of testing the capacity of petroleum to supersede coal and other fuel on shipboard, and also in propelling steam machinery in the factories. The method adopted is the patented invention of Mr. C. J. Richardson, an engineer residing at Kensington. The plan under trial is simply to burn the petroleum through a porous material, which is placed in an iron chamber, dipped into a water vessel also of iron. The oil admitted into the chamber soddens the porous material, and rises by a sort of capillary attraction. The surface then catches fire and burns rapidly, as long as the oil is supplied. The effect of the flame is so great that with the small apparatus, which is only two feet superficial area, and affixed to a boiler, the oil on Saturday was utilised so as to be equal for steam purposes to five tons of coals. A third advantage is obtained by the employment of the petroleum—namely, that no stokers are needed, and the boilers can be supplied with several fires one above another. The small grate used in the experiments was placed under a boiler of 17-horse power, and in two hours it raised the steam to 10lb. pressure. The only objection seems to be the fear of explosive qualities, but these Mr. Richardson states he is prepared to guard against effectually.—*Mechanics' Magazine.*

HOW TO GET A FARM AND WHERE TO FIND ONE.—This is a small octavo volume of 345 pages, by the author of "Ten Acres Enough," and is published by James Miller, 522 Broadway, New York. It gives the leading facts in regard to the several districts open for settlement in this country, including New Jersey, Maryland, and Delaware, the barrens of Long Island, and the western States. It has the text in full of the Homestead Law, which was signed by President Lincoln on the 20th of May, 1862. This law gives 160 acres of the public lands to any family who will settle upon the tract. The book is well printed and neatly bound in paper.

A LOCOMOTIVE with steam up was left standing on a turn-table at Newport a few nights ago, when, by some accident the machinery was set in motion, and the engine tore off swiftly into a neighboring field whence it took four hours of hard labor to extricate it.

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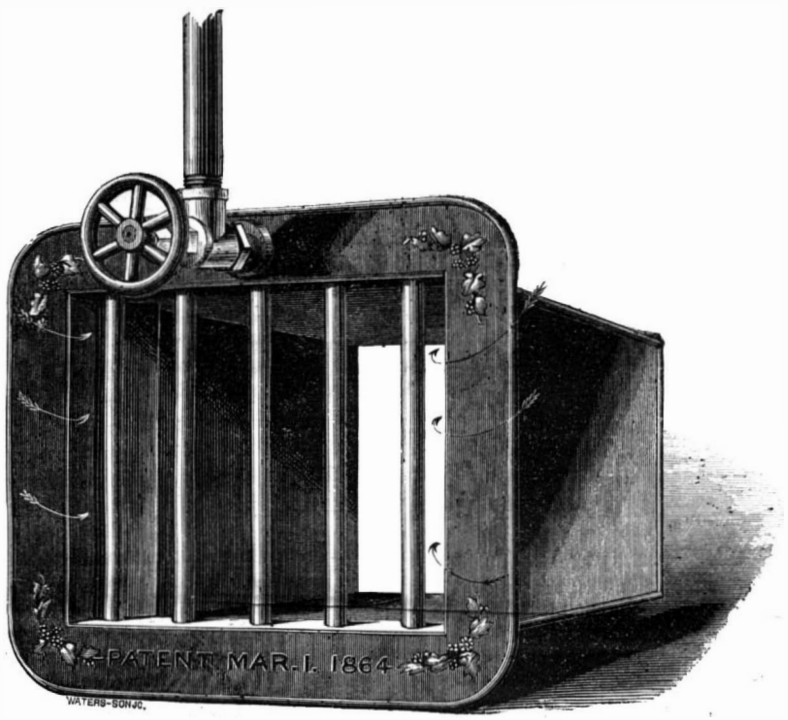
### Improved Steam Blower.

This is a very simple and compact machine for aiding the combustion of fuel in steam boilers. By its use the fire is at all times maintained bright and clear, and the fullest advantage obtained from the coal introduced. An ordinary fan blower cannot be adjusted so as to work fast or slow without great attention. There are times when a moderate draught only is required, while at others the full power is needed; but the fan blower must run alike at all times, thus causing a double waste of the power which drives it, and the heat driven off by it. The action of this blower is mechanical, and it is stated that a saving in fuel is effected by the combustion of the oxygen in the steam, which is set free by passing through the red-hot coals and grates.

The construction of the blower is simple, being merely an oblong case fitted with a front to which is connected a steam pipe. This front supplies steam to the upright tubes which are perforated in the side next the furnace with minute holes from which the steam issues when the valve is opened. These steam jets create a vacuum in the casing and under the grate, which causes the air to rush in rapidly, as shown by the arrows. A draught is thus created and the desired result obtained. The ease with which this blower can be controlled is a valuable feature; it is entirely noiseless, requires no belts or shafting, and is always ready for use. Large numbers of them are now in use. An advertisement can be found on another page. For further information address F. W. Bacon & Co., 84 John street, New York. The invention was patented on the 1st of March, 1864.




HANCOCK'S STEAM BLOWER.

### Improved Skate.

Tripping it on the "light fantastic toe" may be a very agreeable thing for dancers, but the skater wishes to feel that his light fantastic toes are well shod and securely, with the best instruments for his purpose the market affords. The merits and demerits of skates, with or without straps, is a question which will always have strong supporters on both sides. The inventor of this skate, instead of trying to please one side, conciliates each, for they are made in both styles and can be quickly put on and off.

The essential points required of a skate are, that it shall be light, strong, durable and free from liability to derangement. Simplicity in the fastening is also of paramount importance, and to secure a general sale it must be made at a low price.

We think this skate possesses the qualities set forth. It is both light and strong, can be attached with or without straps, and has a solid box where the screw is, so that the heel is held as tight as in a vise.

By the depression of the heel below the sole of the skate the foot is brought on a level, so that the body is erect and without the tendency to pitch forward generally experienced where the heel is higher than the sole. In the first figure there is a side clamp shown where the straps usually are. All that is necessary to attach this skate is to slip the boot in it, as in a shoe, when the clamps adjust themselves. The other skate is worn with one strap in place of the clamp. Both are efficient and durable. We have tried them and found them in all respects equal to the inventor's claims. The skate was patented through the Scientific American Patent Agency on the 16th of June, 1863, by J. J. McCormick, of West Meriden, Conn. For further information address Clark, Wilson & Co., agents, No, 81 Beekman street, New York.

Fig. 1.

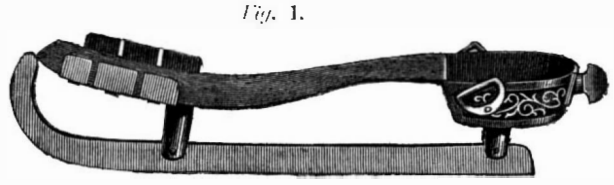


Fig. 2.

M'CORMICK'S SKATE.

Fifty thousand three-cent pieces were recently found in an old boiler in a cellar in Lockport, N. Y.

### Molds for Casting Metal.

Mr. H. Cochrane, of the Ormesby Ironworks, England, has patented an invention, which has for its object the formation of permanent molds for casting iron and other metals, that shall not act injuriously on the casting by chilling the surfaces of the same, or by engendering gases. For this purpose he makes such molds of a composition consisting of fire-clay mixed with black-lead or plumbago, or of fire-clay mixed with black-lead and silicon, or of black-lead mixed with silicon; the composition which he has found suitable for the purpose being one-third of black-lead mixed with two-thirds of fire-clay, with a small proportion of silicon, but he in no way limits himself to these proportions. The molds, when made, are, by preference, dried gradually by a moderate heat.

### New Magnetic Needle.

Dr. Joule exhibited, at a recent meeting of the Manchester Philosophical Society, a magnetic needle for showing rapid and minute alterations of declination. It consisted of a piece of hardened and polished watch spring, an inch long and one-tenth of an inch broad, suspended vertically by a filament of silk. The steel was magnetised in the direction of its breadth. He remarked that Professor Thomson had long insisted upon the advantages which would attend the use of very small bars in most magnetical investigations, and had employed excessively minute needles in his galvanometers with great success. Dr. Joule stated his intention to fit up his needle so as to be observed by light reflected from its polished surface, or otherwise, by viewing a glass pointer, attached to the bottom of the steel, through a microscope. He believed that by the latter plan he should be able to observe deflections as small as 1 second of arc.

### Large Emery Bed Found.

Dr. Charles T. Jackson, of Boston, recently read a paper before the Boston Society of Natural History, in which he announced a discovery which will be of incalculable importance, not only to Massachusetts, but to the country. It is no less than the discovery of a mine of emery. To manufacturers and to scientific men the importance of this discovery is at once apparent.

He said it afforded him great pleasure to announce the discovery of an inexhaustible locality of excellent emery in the central part of the State of Massachusetts, in the town of Chester, Hampden county, within three-quarters of a mile of the Western railroad, and 27 miles from the Springfield armories and workshops. For more than two years the existence of important beds of iron ore had been known in the mountains of Chester, and Dr. S. H. Lucas, who originally discovered and secured them, sought the aid of Boston capital in mining and smelting the ore.

On the 11th of October last Dr. Jackson revisited Chester, and was surprised to find that one of the beds, which all had supposed to be magnetic iron ore, and from which hundreds of tuns had been taken and smelted with the ores of iron found in Berkshire county, was really composed chiefly of pure emery—one part of the bed being properly iron ore. Had not the occurrence of Margarite and Chlorotoid called his attention to the probable existence of emery at this locality, it would have been overlooked to this day, and no one knows how much longer.

The principal bed of emery on the South Mountain, in Chester, is from four to ten feet in width, and is now quarried at the base of the hill. Its course is nearly N. 20 deg. E., S. 20 deg. W., and its angle of dip is 70 deg., and to the eastward, The bed widens rapidly as it rises in the mountain, and in one place where it is associated with a bed of iron ore, 17 feet wide, the emery itself not being less than ten feet in the clear. The highest point where it crops out is 650 feet above the immediate base of the mountain, and the bed goes through both the North and the South Mountains, and has been traced in length four miles. The depth to which it penetrates below the lowest point seen must be very great, so that we may say, without exaggeration, that it is really inexhaustible.

Dr. Jackson next mentioned several interesting scientific facts as to the condition in which the emery was found and the means necessary to be taken in breaking it up by fire, it having been found while quarrying it for iron, that many drills were broken and rapidly used up on account of the hardness. On the North Mountain, which is separated from the South Mountain by a branch of Westfield river, there are found three large beds of rich magnetic iron ore, six feet wide. Dr. Jackson mentions as a singular fact, that although one of the hardest minerals known, it has been smoothed and polished by the agency of drift grinding. The principal bed of emery on this mountain is seven feet in thickness. It is probable that all three of these beds of iron ore will be found on the South Mountain, for they run directly towards it, and it is not far distant.

Practical trials of the Chester emery by skilled workmen, have proved that it is fully equal to the best London prepared emery from Naxos, and in one of the fairest trials it was found to exceed that emery in the work it performed in grinding hardened sword-blades, in the ratio of 20 to 15. The Chester emery, after grinding twenty swords, was far from being used up, while never more than fifteen had been ground by the wheels armed with the London emery. This experiment was made by Mr. Ames, of Chicopee, Mass.

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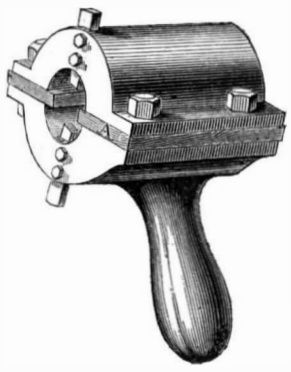
## TURNING TOOLS.

PART THIRD.

A great aid in turning long and heavy shafts and piston rods or shafting for pulleys, is found in what is called a "doctor." This tool is made in many different forms, but the essential principle of it is the same in every case. The object is to confine a number of cutters so that they cannot relax or slide away from the cut; for it will be apparent that should this occur the size would vary. The only change, therefore, in the size of the shaft will be from the wear of the cutting edges; where these are well got up, hardened and set, the loss from such a cause is inappreciable, unless the work be full of sand seams. One kind of a doctor is made in the following manner:—

*Fig.* 16.



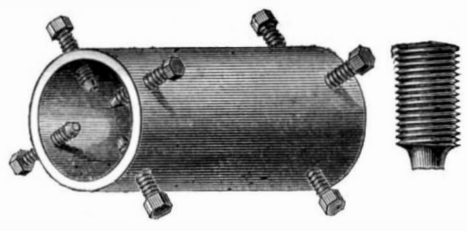
The outside casting is made in two pieces and had a handle on one side. The wooden blocks, A, are placed between the two castings and screwed up tight. The distance between them should be just the size the shaft is when finished, and they serve to steady the tool so that the cutters will not chatter and make the work rough. The cutters are a little ahead of these blocks so that the wood bears only on the turned part of the work. To accomplish this the end of the shaft to be turned must be started with a common finishing tool for a short distance, so that the blocks can be fitted to their places before the doctor is set to work. The cutters are ordinary finishing tools ground square on their ends, and set so as to cut from their outside edges. The whole square face must not bear on the shaft or the tool will jump in. Very many mechanics round off the cutting corner of the tool, but this we think objectionable, for it takes more time to grind it, the tool has a greater surface to cut over, and the edge is more difficult to keep in good order than when square, or a very little rounded. The cutters themselves rest in slots, which they should fit accurately sideways; backing them up with bits of tin or wedges is a slovenly practice, and takes more time than it does to plane the cutters so that they fit properly at the outset; they may be kept in place by set screws or clamps bolted over the end of the casting, and a tap with a hammer on the end will set the tool into the shaft for its cut.

In free, soft, well-forged wrought iron, a doctor is a capital tool, but in scrap iron, in shafts that are full of sand seams and hard spots, it is difficult to make it work well. The sand takes the edge off the cutters and they have to be ground frequently. It is then a difficult matter to set them on the old cut, so that the shaft will be neither smaller nor larger than the part previously turned, nor yet have a shoulder or ridge where the cut was started anew.

Shafting for pulleys at the present day is all turned true and smooth. It used to be the practice to bore the pulleys a sixteenth of an inch larger than the shaft, or an eighth, for that matter, and put set screws in the hub so as to fasten the wheel in place. This way of doing work has been abolished. With such a plan the pulley never runs true. The belt is at one time slack and at another tight, so that the machine driven runs by jerks, instead of easily and smoothly. Grease and dirt also collect on the rough shaft, so that in time the upper part of a factory so fitted looks more like a hen roost than the scene of organized labor.

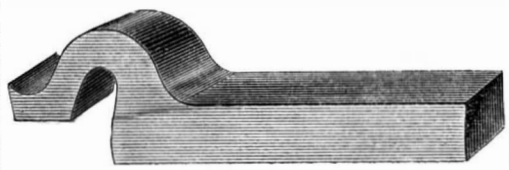
It has always been a favorite idea with us to turn shafting in a lathe as broom handles are turned—that is, in concentric cutters. There is no reason why such a plan should not work with short lengths and small sides. In such a lathe there would be no tail stock or back center, and the shaft, being carried in proper bearings, could be fed through the stationary cutters, just as a broom handle is turned in its lathe. The cutters might be set in a large box in the center of the bed, and the cone pulleys on the lathe spindle, together with the head itself, should slide along, or the shaft might be fed through them. In brief, the shaft might be turned at the last cut just as a boring bar runs in its box. Let the cutters be in the box, and feed the shaft through; with water run upon it the finish would be beautiful and the work true.

It may not be inappropriate to introduce here a fixture of the lathe which is often used in connection with long shafting. The common steady rest which accompanies a lathe is useless unless a bearing be turned for it to work on. With a shaft 18 feet in length and two inches in diameter, this is a very troublesome and uncertain process, for the shaft is so long that it buckles and springs, and rides up on the tool, and often jumps out of the centers. It is to avert such a disaster that this fixture was contrived. It is a very old and very useful servant of the machinist, and is merely a cast-iron sleeve with steel set screws in it. This sleeve is turned true in the center so that it runs in the common rest, and is slipped over the shaft and secured by the screws. The turned part is then set to run true—it makes no difference whether the shaft sags or not—and the steady rest applied. This is a short and simple operation and an extremely necessary one. This is the sleeve spoken of:—



There is another tool much used by some turners, which is called a spring tool, although its virtues are not apparent to us except for special purposes. It is made as shown below, in Fig. 18, and it never "digs in," but goes about its work soberly and steadily:—

*Fig.* 18.



From its shape it will be seen that whenever an undue pressure is exerted on the cutting edge the same will give and recede, or spring down, which is the same, and thus prevent the edge from jumping in. For long shafts or in places where the tool has to be extended a good ways from the post, this will be found useful for finishing with, for it will not chatter if the surface in contact with the job, and the amount of cut, be small. We consider it of doubtful utility for finishing surfaces that require to be true, for every inequality that the edge comes to, if the spring part be strong enough, it cuts off, but if it be weak, it slips over and thus makes bad work. By putting a small wedge between the spring and the shank it can be at any time changed to a solid tool.

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M. Poucel, chief engineer of the Mœrris steamer, belonging to the Messageries Imperiales, informs the Semaphore of Marseilles that, one evening during the steamer's voyage from Alexandria, a strong shock was felt by all on board, and a most unusual agitation was noticed in the water near the screw. The engines having been stopped and a boat lowered, it was found that a whale had got entangled with the screw, which had inflicted a deep and mortal wound just behind the head. With some difficulty the dead monster was extricated and hoisted on deck, when it was found to measure 21 ft. 4 in. in length, with a maximum girth of 13 ft. 9 in.

## POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

The Association held its regular weekly meeting at its room at the Cooper Institute, on Thursday evening Dec. 29, 1864, the President, S. D. Tillman, Esq. in the chair.

After the transaction of some miscellaneous business, the President called on Dr. Parmelee to open the regular subject of the evening,

### THE MANUFACTURE OF BISULPHIDE OF CARBON.

Dr. Parmelee stated that about $50,000 worth of bisulphide of carbon is used annually in the United States. It is a powerful solvent of india-rubber and other gums, and, being very volatile, is easily removed from the solution. It is remarkably transparent, and has extraordinary powers of refracting light; these two properties have recommended its use for lenses in optical instruments.

It is a chemical compound of carbon and sulphur, in the proportion of two equivalents of sulphur to one of carbon, $C S_2$, which is in the proportion of 6 pounds of carbon to 32 of sulphur; the atomic weight of carbon being 6 and of sulphur 16. To effect the combination it is only necessary to bring the two elements in contact at a bright red heat, the atmospheric air and other matters being excluded. Charcoal is heated in a close vessel, and brimstone in small lumps is dropped in upon it. The sulphur is evaporated, and as the vapor comes in contact with the incandescent coal, chemical combination takes place in the proportion stated.

As the bisulphide of carbon boils at 110°, it is, of course, in the state of vapor in the heated vessel where it is formed, but it is reduced to the liquid state by cooling it to its boiling point. When first formed it is mingled with the vapor of sulphur and with sulphuretted hydrogen, but may be purified from these.

The speaker then made drawings on the blackboard of the apparatus which he had employed on a large scale in manufacturing the bisulphide of carbon, but these could be reproduced only by elaborate engravings.

### MANUFACTURE OF CHLOROFORM.

The President gave a short description of the mode of making chloroform, and stated that he was pleased to learn that the first that was ever produced in the world was made in this country, thus completing our claim to the discovery of anæsthesia—the greatest discovery in medicine that has ever been made. It is admitted that nitrous oxide and ether were first employed in this country as anæsthetics, but as Dr. Simpson, of Edinburgh, substituted chloroform for ether in 1847, the English and Scotch lay claim to the discovery. But Samuel Guthrie, of Sacket's Harbor, in this state, discovered chloroform in 1831. Professor Ives, of New Haven, first administered it by inhalation in January 1832.

It is a compound of carbon, hydrogen, and chlorine in the proportion $C_2$ A $Cl_3$. Guthrie obtained it by distilling a mixture of alcohol and chloride of lime, and subsequently rectifying the product.

## PUNCHED AND DRILLED HOLES IN PLATES.

From an interesting and able article on this subject in the *Mechanic's Magazine* we make some extracts.

Not the least important subject is the relative merit of punched and drilled holes. For years engineer have been content to regard the punched hole as being so far perfect, that any improvement upon it was practically impossible. Recently, however, we find that an idea has got abroad that the operation of the punch seriously injures the iron submitted to it. In the almost absolute dearth of experimental results, it is not easy, perhaps, to come to any conclusion upon the subject which can be worth much. The advocates of the drill state that by its use not only is the iron in no way injured, but that a better fit is secured for the rivets, and that the work can be performed so accurately that the use of the drift is altogether done away with. The advocates of the punch, on the other hand, state that the work can be done by it at a price varying from one-third to one-fifth that of the drill, and that practically a joint in every respect as sound and trustworthy can be secured by proper attention and skill. If it can be proved that the iron really does not suffer injury and loss of strength by being punched, then it is certain

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that the drill has so far the best of it. In order to arrive at any decision on this point, it is necessary to comprehend the nature of the injury inflicted.

The first effect of the punch, if properly made, is to crush the fibers not only immediately under it, but for a minute distance round the hole. This action, however, apparently only takes place upon the upper side of the plate. Upon the lower side, with properly made dies, a ring of iron will be found surrounding the orifice which has simply undergone compression, because this ring has sustained the entire thrust of the punch during a certain portion of its descent; but yet its comparative area is so great that no true crushing can ordinarily take place. It would also seem that the lateral action of the button of iron forced out tends to condense and consolidate the metal in the immediate neighborhood of the hole. The fibres undoubtedly suffer some distortion as well, and with this it would seem that the internal changes in the iron must begin and end.

When rivets are made rather long, and carefully set up so that the holes are well filled, in the common acceptation of the word, they exert a direct splitting action upon the plate. Joints cut transversely through such rivets show that they are in such aboslute contact with the iron by which they are surrounded that it is not easy to say which is the plate and which the rivet. There are thus, we see, many operating causes at work tending to reduce the strength of the joints which have nothing to do with the punch, and we are disposed to regard them as being quite sufficient to account for the loss of four per cent of the true strength of the plate, if not much more. Brunel's experiments, conducted some years ago, tend to confirm this opinion. He employed plates of the best Staffordshire iron, .5 of an inch thick and twenty inches long, butt-jointed, and secured together by a fish-plate at each side .375 of an inch thick, and ten 11-16th rivets in each plate. The first gave way with 153 tons, the rivets being shorn through. In a second experiment, in all points the same, the plate was ruptured with 164 tons. There can be no doubt that the difference was here determined by some variation in the quality of the rivets effected by the method of manipulation, or the quality of the workmanship. The sectional area of the rivets was 3.75 square inches, and as they were in double shear, we must take 7.5 as their practical shearing area. The area of the fractured section of the plate was 8.25 inches, and thus the rivet area was about nine per cent less than that of the other plate.

In the operation of punching, holes are invariably slightly countersunk, and there is little doubt that this countersink adds materially to the efficiency of the work when but two or three plates are to be joined. The contraction of a rivet in cooling exposes the head to very considerable strain—one so great, indeed, that it must militate seriously against the powers of the rivet. If there is a good countersink at each side, the heads of the rivets have little to do, and thus an element of safety is introduced. With the drill a countersink cannot be produced, except at a price which at once precludes its adoption, and in drilled holes, therefore, the rivet heads have to do all the work. When three or more plates have to be put together to make up a given thickness, as in bridge building, however, it is probable that the countersink operates injuriously, as a long rivet cannot be made to fill the holes. The system adopted in the construction of the great Charing-cross railway bridge may then be resorted to with advantage. All the holes were punched .5 of an inch too small. When the plates were put in place, a small traveling engine bored or reamed them up to the proper size, and the rivets or bolts were then driven home tight by a species of "dolly" extemporized for the purpose.

It is quite certain that, although good or even fair iron in the plate may be punched with impunity or positive advantage, bad angle-iron cannot be so dealt with, unless the punch, dies and presses are in the very best possible order, and of the very best construction. The best iron may be seriously injured by a dull punch, which wedges its way through the metal instead of stamping the bit out of it cleanly. Good apparatus is seldom to be found in establishments where bad iron is much used, and the probable result of the introduction of any cheap system of drilling would be that iron of the very worst and most rotton description would be worked up as it cannot be worked up now; while with good irons no advantage whatever would be derived from the use of the drill to the exclusion of the punch.

## Correspondence

### Seasoning of Timber and Lumber.

Messrs. Editors:—Mr. H. G. Bulkley's letter in your issue of the 2d inst., on the seasoning of lumber and timber is good and well timed, as all timber that is used for railway or building purposes should be thoroughly seasoned, both for its own preservation, and that no open joints should be caused by shrinkage, to make the work look and be bad, sometime after it is put together. In places where the timber is exposed, moreover, open joints allow water to get in, and so hasten its decay. The use of steam, however, for drying, is far from new. I have used, and seen it used, many years ago. By seasoning timber in the sun, the outside cracks and opens in seams, and warps before the inside is dried. Hot air has the same objection, but in a less degree. Steam heats the timber through as well as hot air, and by its own deposit of moisture on the exposed surfaces prevents them from cracking and opening into seams. Superheated steam, however, is unnecessary; for immediately on its introduction into the chamber containing the timber, it would be condensed into ordinary ~~steam.~~ ~~The~~ commonly used method for preserving timber, such as creosoting, have in very many cases failed of their proper effect, because the substances injected into the outside of green timber, under great pressure, filled up the outside pores, thereby preventing the moisture inside from getting out, and thus rather hastened than prevented decay. This is the reason why timber prepared by creosoting has not been benefited; whereas, if the process by steam had been understood and adopted, the good that was expected would have been realized.

I am much pleased to see this question opened, and hope Mr. Bulkley will receive remuneration for his large outlay, in the shape of heavy consignments of timber, &c., to be prepared by him, as I presume, from his letter, that he is engaged in this kind of work.

Wm. Toshach.

54 William Street, New York, Dec. 29, 1864.

### Compressed Air.

Messrs. Editors:—On page 275, Vol. XI., of the Scientific American, we find that steam conveyed 1,100 feet through pipes only lost five pounds per inch. Would compressed air lose more power by passing through the same amount of pipe? Could compressed air be used in the mines, with the same amount of steam to compress it, as steam is now used; or, what would be the loss by using compressed air for work in the mines?

J. H. T.,
Co. C, Second Colorado Cav.

Fort Riley, Kansas, Dec. 17, 1864.

[Compressed air has been used several years for driving machinery in one of the mines in Scotland. It is also employed to drive the drilling machines in the great Mont Cenis tunnel, and we have seen a number of sewing machines driven by it in this city. Whether air would be more efficient than steam in the case cited involves questions of heat and condensation which make the problem as complicated as that of expansion.—Eds.

### Boring for Oil near Chicago.

Messrs. Editors:—As you were kind enough, in a recent number, to notice this work, I now have the pleasure of stating to you that we have struck the greatest flow of water of which there is any public record. This well is five inches in diameter and seven hundred and eight feet deep. On the morning of Thursday last the water came to the surface with the rush and roar of a great torrent. It is now discharging 400 gallons per minute, 24,000 per hour and 576,000 per day. The water is clear as crystal, perfectly sweet and pure, and remarkably free from taints of sulphur and other disagreeable substances. The well of Grenelle, in France, discharges half a million gallons per day, but the water is warm (85° Fah.) and can only be used for heating the hospitals and for mechanical purposes. This water can be used for any purpose and has power enough to carry it in pipes one hundred feet above the surface.

Geo. A. Shufeldt, Jr.

### The American Cotton Spinner.

Messrs. Editors:—I notice in your issue of January 2, 1865, that a correspondent wishes to be informed what is the best work on the practical operation of cotton machinery. He says—"I have a work entitled the 'American Cotton Spinner,' but it does not explain the point I wish to understand, which is:—Suppose a man was about to start a mill, he wishes to produce cloth that shall weigh four, five or six yards to the pound, that will require a certain number of yarn according to the sley and pick of the goods. Now what weight of cotton shall be spread on a given space on the lapper apron, so that after it has passed through the different machines with whatever draught they may have, the result shall be the number of yarn required."

I would say that the "American Cotton Spinner," also "Scott's Cotton Spinner," gives the desired information. To be sure neither of these works gives it in so many words, but they give the basis of rules by which we are able to work it out. Books will not work or think for us, we must do that ourselves. With a little thought and study, and some practical knowledge, and with the aid of the "American Cotton Spinner," I think your correspondent will be able to work it out. Allow for waste about 15 per cent. If he should not succeed I will be glad to hear from him.

Otis B. Morse,
Mechanical Engineer.

Chicopee, Mass., Dec. 30, 1864.

[The "American Cotton Spinner" was published by Henry Carey Baird, 406 Walnut street, Philadelphia.—Eds.

## NEW BOOKS AND PUBLICATIONS.

A Year in China. Published by Hurd & Houghton, New York. Price $2.

The author of this pleasing narrative is Mrs. H. Dwight Williams, wife of the United States Commissioner, stationed at Swatow, one of the five ports through which commerce from other countries is admitted into the Chinese Empire. The authoress had excellent facilities for gaining accurate knowledge of the life and manners of those curious people, and her style of narrative is clear, simple and agreeable. Considerable attention is bestowed upon the Chinese women, and much entertaining and instructive matter is given in regard to them. Mrs. Williams was a passenger, homeward bound, on the ship *Jacob Bell*, which fell into the hands of the pirate *Florida*, Capt. Maffit. An account of the capture and the scenes which followed are graphically set forth.

The Fire on the Hearth in Sleepy Hollow. A Christmas poem of the olden time, by Edward Hopper. Published by Hurd & Houghton, New York.

For a few years past we have devoted but few of our spare moments to the perusal of unpretending poetry, nevertheless, we often meet in the newspapers, with gems from unknown sources, and of beauty so rare as to awaken a strong desire to know the authors. About a year ago, some true mother indited a most touching "Christmas Eve," referring to a vacant stocking that one year before was filled for a dear one who since had died. It was a poem worthy of a Bryant, but the authoress is unknown. Mr. Hopper is to us a new candidate for poetic honors, but in his little volume are found many most exquisite productions, which will find a hearty welcome to the fireside. The book is inscribed to John Taylor Johnston, Esq., one of our well known citizens.

Trow's Daily Calender for 1865.—John F. Trow, No. 50 Greene street, New York, has just issued his yearly calendar, which is one of the most convenient things for the purpose that we have ever seen. Upon three hundred and sixty-five separate papers, corresponding to each day in the year, are printed the day and date and other useful matter. These papers are secured in a paper frame work, and one of them is to be removed daily to show the cor-

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rect date. It is not only a good timekeeper, but it presents a summary of useful facts which are often quite valuable.

Our Young Folks.—Messrs. Ticknor & Fields, of Boston, the well-known publishers, have just commenced the publication of an illustrated magazine for boys and girls, bearing the above title. It is edited by J. T. Trowbridge, Gail Hamilton and Lucy Larcom, names which guarantee a sterling character for the new work. The first number now before us contains several spirited illustrations and articles well adapted to amuse and instruct the youth of our country. Published monthly at $2 per annum.

Pearls from Heine.—Published by Frederick Leypoldt, of Philadelphia. This is a beautifully embellished work embracing a few of Heinrich Heine's choice poems. For sale at Hurd & Houghton's, New York.

We are indebted to Wm. Faxon, Esq., Chief Clerk of the Navy Department, for a copy of the Report of the Secretary of the Navy and accompanying documents. It is a voluminous work of 750 pages.

## RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

*Spur Carrier, Boot-drawer and Pantaloons Guard.*—The object of this invention is to provide a means of instantly drawing off heavy boots, supporting a military spur so that it cannot fall, and to prevent pantaloons from getting under the heel and being trodden upon, all of which is accomplished perfectly. The illustration of it can be found on page 352, Vol. XI. of the Scientific American. Egbert P. Watson, of New York City, is the inventor.

*Car Spring.*—This invention consists of a spring composed of two arms each of which is supported at two or more points by blocks of india-rubber, or by springs of any other suitable material, in such a manner that one of said blocks or springs forms a yielding platform for each of the arms, and that by the combined action of all the springs considerable motion is allowed to the outer end of each arm which supports the car or other vehicle; the invention consists also in the application of toggle arms connecting the ends of the arms which are supported by springs in such a manner that a spring constructed according to this invention will readily adapt itself to a heavy or light load by changing the bearing point or points toward or from the center of the toggle arms; it consists finally, in the use of an adjusting screw in combination with one or more of the springs bearing on the arms, in such a manner that the power of the spring can be adjusted at pleasure. Andrew Buchanan, of Brooklyn, is the inventor.

*Steam Engine.*—This invention consists in an engine with two pistons which work in square cylinders, and are connected by a rigid bar carrying two studs, in combination with a lever secured to the end of an oscillating shaft on which is mounted a cog wheel or pinion gearing in toothed racks attached to or cast solid with the two slide valves, in such a manner that by the action of the studs striking the oscillating lever, the valves are changed at the proper intervals, and one cylinder takes steam while the other exhausts, and by these means a constant reciprocating motion is effected by the action of steam, hot air or water. Daniel Sexton, of San Gabriel, Cal., is the inventor.

*Machine for Chopping Meat.*—This invention consists in the employment or use of removable guides in combination with the cutter head in such a manner that by withdrawing said guides the cutter head can be turned upside down and the knives thereby cleaned and sharpened without removing them from the head and the operation of introducing the meat to be chopped and particularly that of removing the chopped meat from the machine is considerably facilitated; the invention consists further in making the block vertically adjustable and in steadying the same by a pin or shaft which runs from the center of the block and which has its bearings in a slatted bridge which straddles the gear or worm wheel, by means of which a rotary motion is imparted to the block; the invention consists, finally, in the use of an endless screw and worm wheel for the purpose of imparting a rotary motion to the block, thereby rendering the machine simpler than those of ordinary construction and reducing its cost. William G. Bell, of Boston, Mass., is the inventor.

*Roller Gin.*—This invention consists in making the the drawing, in roller of Roller Gins, partly elastic and partly solid, either by rubber rings placed straight or spirally around it, or by securing segments of rings thereon; the elastic and solid surfaces being afterwards covered by a suitable material of flexible character. J. F. Brown, of New London, Conn., is the inventor.

*Stump Extractor.*—This invention consists in the application to the machine of a lever and springs or elastic bars arranged in such a manner with pawls and a ratchet that the same means which is employed to extract a stump or raise a body, may be also used for gradually lowering it. The invention also consists in the employment or use of a brake arranged in connection with the ratchet and in such a manner that an elevated body may, by a simple application of power on the part of the attendant or operator, be held in suspension until it is necessary or convenient to remove it. Hiram Lemm, of St. Joseph Co., Mich., is the inventor.

*Street Gas Lamp Posts.*—The object of this invention is to provide a means for the exact measurement of the gas which is consumed in street or solitary lamps. The improvement consists in the combination of a gas measuring register or meter, either of the wet or dry kind, with the lamp-post, the meter being placed in the hollow base thereof. J. P. Hunt, of Manchester, Hillsborough Co., N, H., is the inventor.

*Lubricators.*—This invention relates to certain improvements in oil-cups or lubricators whereby the caps and shank are firmly and rigidly connected together by continuing said shank upwards in the form of a central spindle, admitting of the use of a detachable or independent reservoir of glass or other transparent material of any desired shape without danger of fracture by expansion or contraction, thus insuring the production, at small cost, of a superior article which combines the features of a transparent body and a graduating feed. John Broughton, 41 Center St., New York, is the inventor.

## European Petroleum.

At the Wallachian Petroleum Company meeting, Dec. 6, an elaborate report on the petroleum districts in Wallachia, prepared by Prof. Chev. G. Capellini, was submitted, from which it appears that petroleum in Wallachia is found only in tertiary formations (which is not the case in America), associated with deposits of salt, sulphur, and gypsum. Prof. Capellini considers that in all the tertiary formations of the Carpathians petroleum is to be found, but the deposits by far the richest and most important refer to the Miocene period, the richness and abundance of which deposits depend, in inverse ratio, upon their relative antiquity. He regards as the most favorable localities for exploitation of petroleum those where the deposits belonging to the upper Miocene form the small valleys lying at right angles to the tributary streams of the Danube. These observations induce him to admit the existence of petroleum, or at least of strata simply bituminous, in many parts of Wallachia, where up to the present no researches have been made, and where even its existence is unsuspected. These positions may be explored later, and meanwhile they serve to show what a vast field for enterprise is afforded by the Wallachian petroleum, its magnitude being such as to preclude the possibility of the clashing of interests of the various companies now exploring it.

From the Professor's report it appears that unmistakable traces of petroleum have been found in several places on that company's property. At Lower Scortzeni there are several wells, some of which are productive, and might be rendered more so. A kind of wax, or condensed bitumen, is found near Scortzeni, in the alluvial formation, which he believes to have originated in previous petroleum sources. He thinks this wax is identical with ozokerite, already found in Moldavia, and well known to mineralogists. This wax does not exist on the company's territory, but an analysis might show that its working would be profitable. At Podeni Nou there are eight wells sunk, in nearly all of which water accompanies the petroleum, No. 6 being the only one richly productive. At Gura Draganassa some wells at the bottom of the valley give hopes. In his remarks on the most desirable means of conducting the works and rendering the enterprize as lucrative as possible, he recommends that during the bad season operations should be diminished, and works scarcely commenced should be suspended, proceeding with only those of immediate promise, and that only on the most economical principles. In the next place, instead of exporting crude petroleum, it would be exceedingly profitable to refine the same before it leaves the Principalities. Not only would this diminish the expense of freight, but also a great quantity could be sold in Greece, Italy, and elsewhere, and that at a price lower than is now current in those markets. This cannot fail, if on an extended scale, to enable successful competition with American produce throughout Europe.—*London Mining Journal.*

## MISCELLANEOUS SUMMARY.

A "monster improvement" is nearly completed at Chicago by the Dock Company, who have planned a magnificent system of docks, embracing a water front of five miles, the whole connected by seven ship canals cut at right angles with the river. These canals are 100 feet wide, 12 feet deep, and average 1,760 feet in length. By the same plan a connection is made with a complete railway system. The capital of the company is $650,000.

Not New.—An English paper says that among the novel proposals of the day is one for the construction of a small battery in the cross-trees of men-of-war. The battery is to be made of strong iron-plating, to be very small, ~~just sufficiently~~ large to work a small rifled gun, which can be hoisted in time of action, and with which it is thought the decks of the enemy could be swept.

[Nothing new. Howitzers in the tops were used with great effect by Farragut at the capture of the New Orleans forts—Eds.

The Philadelphia coal-dealers now deliver their coal in sabks. In Great Britain this method is compulsory, and much annoyance and dust is thereby saved to consumers and the public. The sacks are required to hold a certain quantity each, and the carman must carry them into the place of storage. The coal wagons are compelled likewise to carry a portable weighing machine, so that the purchaser can, by having one sack weighed and counting the rest, form a pretty correct estimate of the weight of coal actually delivered.

We read that the pork packing business at the West this year will be more important than ever, on account of the extraordinary prices that prevail. Probably 3,000,000 hogs will be packed, and at an average weight of 220 pounds each hog will be worth $26 40, and the whole of them $79,000,000. If the Wandering Jew, in his travels, ever came over to visit this continent, he will undoubtedly pass by Chicago and Cincinnati in disgust.

Dusters.—The time for picking chickens has come, and it may be suggested that very neat dusters can be made by taking the curved feathers from the neck and elsewhere, and fastening them neatly to the end of a tapering pen-holder, or other handle, and then adding a neat finish with a bit of morocco. By a little tasteful arrangement of the parts, these dusters are not only useful and ornamental in the house, but may be sold at the shops.

Scientific and Mechanical Works.—We are continually appealed to by correspondents to state where certain mechanical works can be purchased. We refer all our readers to Mr. H. C. Baird, of 406 Walnut street, Philadelphia, who has just issued a catalogue of new publications, embracing nearly every branch of science and handicraft.

The American Philosophical Society of Philadelphia have awarded the Magellanic prize to Pliny Earle Chase of that city, for the discovery of numerical relations between gravity and magnetism. The prize is a gold medal of the value of ten guineas sterling.

The white fish of our great lakes have attracted attention abroad, and it is proposed to introduce them into the lakes of Cumberland and Scotland, now almost valueless.

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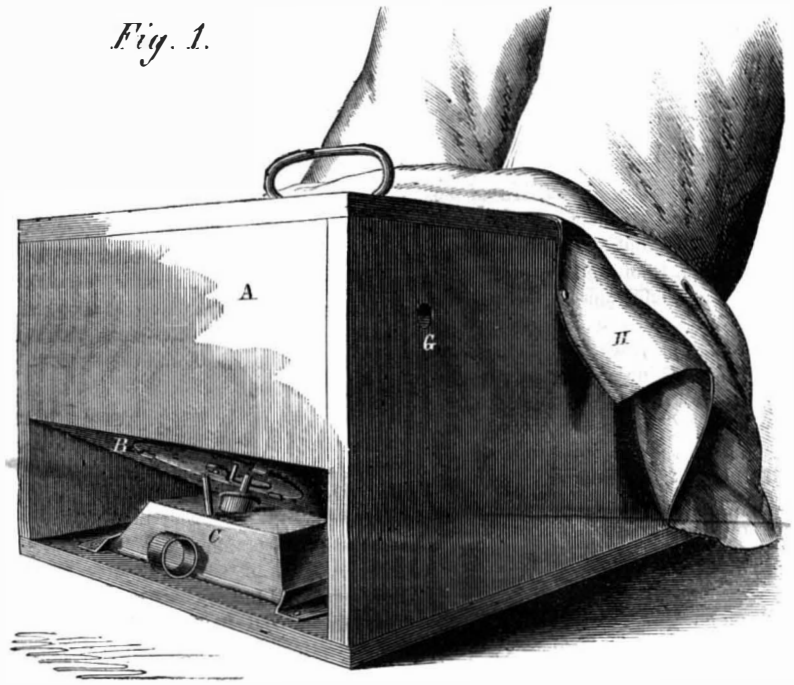
### Improved Foot Warmer.

"Keep your feet warm and your brain cool," is the advice of a celebrated physician, and very sensible advice it is. Cold feet cause chills to crawl up the nether limbs, freezing the blood, and as Hamlet says, "making each particular hair to stand on end, like quills upon the fretful porcupine." With some cold feet are congenital, or born with them, while others acquire the delightful sensation by exposure, or wearing wet boots. Temporary make-shifts are often adopted as a cure for this affliction, and those who go sleigh riding find warm bricks agreeable, or bottles of hot water, but from these the caloric soon radiates so that they are as dead and frigid as an iceberg at the North Pole.

Fig. 1.




### HUNT'S FOOT WARMER.

Hunt's foot warmer, here illustrated, is better than a hot brick, better than a bottle—(of hot water) and gives forth a perpetual warmth which is simply delightful.

The arrangement is simply a wooden case, A, with a partition in it, see fig. 2. This partition has a sliding cover which admits the tube of a spirit lamp, C, placed in the lower part of the box. Above the partition is an inclined foot-rest, D, which is faced with metal, E, on the lower side. The flame heats this metal and also warms the air contained between the foot-rest and partition, so that a genial atmosphere is the result. No matter what storms may rage outside it is always summer within. The cleats, F, on the foot-rest, prevent the boots from burning, and there is a small aperture, G, in the top which creates a draft and allows the heated gases and air to escape as fast as they are burned up by the lamp. This foot warmer is very convenient in size and the lamp holds alcohol enough to burn a long time. The apron, H, is thrown over the feet, to prevent the hot air from escaping. It is the subject of two patents dated respectively, Feb. 25th, 1862, and July 22d, 1862; both patented through the Scientific American Patent Agency. For further information address Solomon Hunt & Co., P. O. Box 90, or No. 30, W. 5th st. Cincinnati, Ohio. See advertisement on another page.

### NOTICE TO SUBSCRIBERS.

Hereafter, until further notice, the price of the Scientific American will be as follows:—When sent by mail, $3 per annum; $1 50 for six months; $1 for four months, When delivered in the city by carriers, $4 per annum. Single copies at the publication office and at periodical stores, 8 cents each.—The postage on the paper by mail is 20 cents a year, payable quarterly in advance at the post office where received.

William Hartway, against whom an injunction was issued for infringing a patent, was recently sentenced in this city to thirty days imprisonment and a fine of one hundred dollars for disregarding the injunction.

### New Food.

Experiments in fattening beef cattle have recently been tried by Capt. Hoff, of the Soldier's Rest, at Alexandria, which demonstrate most clearly the superior qualities for such purposes of damaged hard bread and hay, mixed together, and subjected to a considerable pressure of steam, which effectually removes all mold and sourness. Beef is fattened in this manner more rapidly than by any other process, and the meat rendered exceeding tender and juicy. Thus a vast waste of bread and hay are obviated.

### Effects of the Cash System.

The Mercantile Agency of R. G. Dun & Co., of this city, have published an annual review of the condition of the mercantile, manufacturing and trading interests of the country. They record but 510 failures in the Northern States during the past year, with liabilities amounting to $8,576,700. In 1861 there were 5,953 failures in the same States, with liabilities amounting to $178,632,170, and for the past eight years the average annual number of failures has been 2,832, and the liabilities $33,830,048.

### DODGE'S ADJUSTABLE CASTER FOR SEWING MACHINES.

There are many cases where it is necessary to move sewing machines from one apartment to another, or from a dark corner to the light. As the machines are now made they have to be carried, or lifted bodily, which is very hard work for ladies, who have to perform this duty usually in the absence of the more sturdy sex. We have often remarked the necessity for some such attachment as the one here shown, and believe that it will meet with favor from those interested. If common casters are applied, the machines slide to and fro, or else rock on the narrow points of contact afforded by the rollers, and thus make action of the machine uneven and disagreeable.

By the application of these fixtures the casters can be made available for transporting the table to any part of the room, or the machine may be instantly let down on a firm, solid bearing so that no instability is experienced.

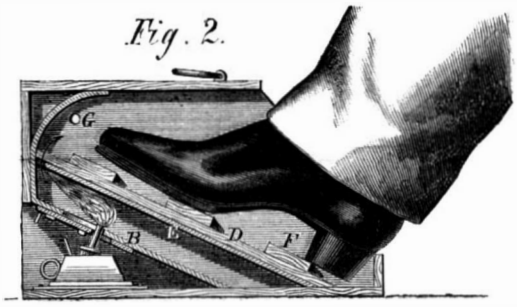
By simply turning the handle, A, down, the weight of the table is raised, and the casters thrown into action, and by turning it up again the table sets firmly upon its legs. The raising is effected by the cam, B, which bears on the pin seen in the slot, C; the pin is in the rod, D, which in turn is fastened to the legs, E, so that by moving the lever as described the table is set upon its legs or the casters, as the case may be. We learn from the inventor that this invention is to be applied shortly to some of Wheeler and Wilson's machines. It was patented May 17th, 1864, by W. C. Dodge, of Washington, D. C., whom address for further information.

### SPECIAL NOTICES.

Hugh & James Sangster, of Buffalo, N. Y., have petitioned for the extension of a patent granted to them on June 10, 1851, for an improvement in lanterns.

Wm. P. Uhlinger, of Philadelphia, has petitioned for the extension of a patent granted to him on Oct. 8, 1861, for an improvement in "Designs," for school desks.

Fig. 2.




It is ordered that the said petitions be heard at the Patent Office, Washington, on Monday, Feb. 20, 1865.

All persons interested are required to appear and show cause why said petitions should not be granted. Persons opposing the extensions are required to file their testimony in writing at least twenty days before the final hearing.

Fine Photographs of Machinery.—Mr. George C. Rockwood, of 839 Broadway, has shown us some photographs of machinery which are unsurpassed for sharpness and clearness of outline. Photographs of this kind of work are difficult to take, for unless the lights are well managed, the bright work becomes a blotch, the parts run into each other, and the design and details are wholly unintelligible. These photographs are open to no such objections, and one in particular, of a locomotive, commanded our admiration by reason of its distinctness and harmony in tone.

Matches.—The heavy tax on friction matches is defeating its object. The *Portland Advertiser* says that matches are now imported into the United States from New Brunswick, and sold in packages suitable for the retail trade, without paying any tax under the internal revenue law. The duty for importation is very much less than the stamp duty upon friction matches of domestic manufacture. The consequence is that the imported matches are sold so low that manufacturers of matches in this country cannot compete in the market. Already, at least three manufacturers of matches have removed from Maine to New Brunswick, to carry on the business there.

An inventor of a hay-press in Maine has experimented with his machine in pressing pine shavings for kindling. They make very neat packages, and can be sawed into blocks like timber. About a hundred bushels of shavings can be put in the space of an ordinary hogshead, and when once pressed the spring is all taken from them.

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THE

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NEW YORK, SATURDAY, JANUARY 14, 1865.

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## STEAM ON COMMON ROADS.

Steam carriages on common roads have for many years been a favorite scheme with inventors. The idea is attractive to the mechanical mind, and it is no wonder that men of genius have been charmed with it. To roll over the highway, fast or slow at will, to travel from one end of the country to the other without fear of wearing out horse flesh, to be ready at all hours and seasons for the journey, to have the control of an almost illimitable force under one's hand, would certainly be pleasant in many respects, and every one of the sensations alluded to has already been realized. However alluring the scheme may seem the day is far off when the system will be popular.

From the early part of the century up to the present day, inventors have brought forth one steam carriage after another, but at this time the number in existence in this country, to say nothing of those in use, may be counted on the fingers. Forty years have developed the locomotive of to-day, but the same period has witnessed little or no improvement in steam carriages. Variations in design, in detail, in the manner of applying the steam power have certainly been introduced, but the boilers used twenty-five years ago on steam carriages were quite similar to those now employed in locomotives, and no difficulty was found at that time in making all the steam required. The chief cause which led to the discontinuance of the street locomotive in early years is the same that affects it to-day—unpopularity. To be sure, in former periods a most active opposition was carried on against steam carriages by stage coach proprietors, but they had at that time as they have since had a fair trial and are not found desirable. The self-propelling steam fire engines, built in this city are seldom if ever used and we lately saw the finest and most powerful one ever built, the *Niagara*, torn to pieces at the Novelty Works. The private steam carriages built by divers ingenious men have also come to grief in one way or another, and quite recently the inventor of the latest one declared in our office that the continuous jarring the working parts were subjected to was a very great disadvantage, necessitating continual repair and giving great anxiety.

Admitting that all mechanical difficulties can be surmounted, the steam carriage for family use or for private purposes will never come into general use. When we can make every gentleman his own engineer, when we can renew a piston packing as easily as we can mend a broken harness, or repair a broken connection as speedily as a fractured thill, when we can adjust a displaced eccentric or a valve out of order as readily as a check-rein, when we can find fuel by the wayside and clean water as cheaply and with as little delay as we can bait a horse, when mankind in general are mechanicians and understand the cause and cure of disabled steam engines we may expect to see horses deposed and supplanted in a great measure by machines that never tire. Unless these things come to pass the adoption of steam carriages on common roads is a long way off. We have said nothing of more serious difficulties in the way of the employment of these vehicles, such as weight, damage to the roads, helplessness when broken down, and similar objections, but these militate greatly against the general introduction of steam carriages on common roads.

## WHAT IS UTILITY?

A knowledge of the motions of the heavenly bodies is useful, because it enables the mariner to navigate his vessel with greater certainty and safety. But what is the use of navigation? There is no article absolutely necessary to the support of life that cannot be obtained without foreign commerce. The commodities brought from abroad are useful because they increase our enjoyments. Ships that come from Rio or Java enable us to have a steaming cup of coffee at breakfast in place of a tumbler of cold water, and those from China give us the cup that cheers but not inebriates, at tea. All things are useful which add to the sum of human happiness.

It is true that the demand for some things takes precedence of the demand for others. If we are deprived of atmospheric air for five minutes we perish, and the power of enjoying any earthly good is brought to an end. The next want in the order of imperativeness is some beverage for the gratification of our thirst, the next is food, the next clothing and shelter; and when these first necessities are satisfied, we desire, in various order, all the innumerable commodities which contribute in any way or in any degree to the gratification of our unlimited desires.

It is, of course, wise to direct our efforts first to procuring those commodities which are essential to the continuance of our lives. But when these are obtained in ample supply, it is just as wise to devote any further efforts that we may make, to the gratification of other and higher wants. A man with an income of $10,000 a year, who has in his cellar and storeroom all the food that his family can consume before it will spoil, may find that a good book or a handsome picture will contribute more to his enjoyment than an additional barrel of beef or chest of tea; in this case the book will be more useful to him than an additional quantity of food.

To Sir Isaac Newton a knowledge of the motions of the heavenly bodies was useful in two ways; it furnished him with the luxuries resulting from foreign commerce, and it gave him a higher and keener enjoyment in the intellectual gratification resulting from the acquisition and possession of the knowledge. Whatever contributes to this intellectual gratification is, in its proper place and time, as strictly useful as ships or machinery. No one recognised more clearly than Sir Isaac Newton himself the propriety of making intellectual pleasure subordinate to more imperative demands. When he was invited to lend the aid of his great intellect to the task of restoring the currency, the derangement of which was felt to be a greater burthen than the war then being waged against the power of Louis XIV., he accepted the invitation with alacrity; and when, through his efforts, milled coin of full weight were ringing on all counters, he returned to his scientific investigations with a keener enjoyment from the feeling of having discharged with fidelity his duty to his country.

There is nothing more useful than knowledge, and every kind of knowledge, by its power of contributing to either physical or mental enjoyment, is indued with its own measure of utility.

SALEM is about to add one more to the list of cities in Massachusetts which have provided themselves with an ample supply of water. Worcester and Charlestown celebrated such an event recently. Lynn, Springfield and New Bedford are engaged upon similar enterprizes.

## CHARCOAL.

That a highly complex organized system, like the human body, should be subject to various conditions, such as drunkenness and soberness, sleeping and waking, disease and health, life and death, may not be surprising; but that carbon, a simple element, should exist in conditions as varied and opposite, is a puzzle and a mystery.

If we wish for some substance that will catch fire from the smallest spark, we find that among the thousands of bodies, simple and compound, that exist in nature or are produced by art, the most suitable for our purpose is pure carbon in the form of tinder. On the other hand, when we want a crucible that will bear without taking fire the flame of the hottest furnace, we make it of pure carbon in the form of plumbago.

The wax mold of the electroplater is a non-conductor of electricity, and it is therefore necessary to cover its surface with some good conducting material; it is found that the best material is finely pulverized plumbago. But this same element when crystalized as the diamond is the most perfect of all non-conductors.

Carbon in one state is as soft as lampblack, in another it is the very hardest substance known; in one, it is brilliantly transparent, in another, it is perfectly opaque; in one, it is the most costly ornament in the crowns of kings, in another, it is shoveled out of the way as worthless rubbish.

In all these changes in the condition and properties of carbon no law can be discovered, with the single exception that the temperatures at which various kinds of charcoal will take fire are in fixed relation to the temperatures at which the several kinds were prepared. This is of the utmost importance to the manufacturers of gunpowder, and they have caused it to be investigated with great care. The following table of the charring and ignition temperatures of charcoal from the same kinds of wood is given by Muspratt:—

| Charring Temperature. Degrees. | Temperature at which the Charcoal takes fire. |
|---|---|
| 500 | 644 |
| 518, 536, 554, 572, 590 | 644 to 680 |
| 608, 626, 644, 662 | 680 to 698 |
| 893 | 752 |
| 1873, 2282, 2372, 2732 | 1122 to 1472 |
| Charcoal prepared at the point of the fusion of the cylinder..... | 2282 |

THEY have set up a twelve-inch steam whistle at the Manchester Locomotive Works which, it is said, can be heard ten miles, and has a very decided effect on the sleepers in the morning.

## THE TORPEDO SHIP.

In powder-mill explosions one of the most mysterious circumstances is the distance to which the fire will be communicated from one building to another. It is not uncommon for two or more distinct reports to be heard, the fire catching in one shop, and the flames an instant afterwards blowing up a second shop situated at the distance of several rods. So well is this understood by powder manufacturers that they resort to various precautions to prevent an explosion in one of their buildings from extending to the others, such as scattering their buildings at considerable distance apart, and planting groves of trees between them.

It was doubtless the design to render available this power of gunpowder explosions in blowing up the magazine of Fort Fisher. We should not have expected success, however, if the ship was to be fired at a distance of five hundred yards—more than a quarter of a mile. If the vessel could have been got within 100 yards, it is quite possible that the plan would have succeeded.

A NEW invention in France is said to be a pair of musical boots, which have been exhibited to the Emperor. At every step the pressure of the foot produces melody—it may be a waltz, a mazourka or an operatic air. This arrangement would be extremely convenient for a dancing master.

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45,685.—Steam Pressure Gage.—E. H. Ashcroft, Lynn, Mass.:

I claim a corrugated disk spring, hardened or tempered substantially as set forth.

45,686.—Plaster and Seed Sower and Roller Combined.—Henry S. Babcock and S. H. Jenks, Ionia, Mich.:

We claim the plaster box, 14, having an unobstructed opening extending the whole length, the adjustable bottom plate, 13, and toothed reciprocating bar, 12, in combination with the seed-sowing device and land roller, the several parts being constructed and arranged substantially as and for the purpose set forth.

45,687.—Cultivator.—Ira Rarber, Jr., La Porte, Ind.:

First, I claim the pivots, c, pivoted with the pronged or forked ends, and arranged as shown in relation to the beam, c, and frame, O', in combination with the plow beams, L, operating as and for the purposes herein shown and set forth.

Second, I claim suspending the rear ends of the plow beams, L, by the chains, d, in combination with the pivoted front end of said beams, for the purpose of enabling the operator to give the shovels the lateral motion, substantially as and for the purposes herein specified.

45,688.—Combined Register and Summer Piece.—S. S. Bent. New York City:

I claim the combined register and summer piece for grate frames, constructed substantially as specified.

45,689.—Bread and Vegetable Slicer.—S. E. Blake, Worcester, Mass.:

I claim the combination of the eccentric slicer, G, adjustable feed box, feed block, N, and rack, O, when constructed and operated substantially as and for the purposes described.

I also claim the combination of the adjustable cam, P, with lever, Q, pawl, R, rack, O, and springs, h S, for the purpose of adjusting the length of the feed, substantially in the manner herein described.

I also claim the combination of the lever, Q, pawl, R, rack, O, and rod, U, for the purpose of disengaging the pawl from the ratchet, substantially as herein described.

I also claim, in combination with the revolving eccentric slicer, G, feed box and feed, the protecting shield, K, substantially as and for the purposes described.

I also claim the combination of the revolving slicer, adjustable feed box, and adjustable feed, when the several devices are constructed and arranged substantially as and for the purposes described.

45,690.—Refrigerator.—T. S. Blake and O. E. Mosher, New York City. Ante-dated Feb. 12, 1864:

I claim the arrangement of the air chamber, d, rack, c, and conducting plate, D', with the bottom, D. water trough and plate, E, and box, A, all in the manner herein shown and described

[This invention relates to a new and improved refrigerator, which is principally designed for operation on a large scale, for the use of butchers, etc.]

45,691.—Arms for Dolls.—C. F. Blakeslee, New York City:

I claim as an improved article of manufacture an arm for dolls constructed by stamping or cutting out of leather of suitable thickness with the fingers and adjacent part of the hand completely cemented together, so as to have the necessary form and rigidity, without stuffing, all as herein described.

[This invention relates to an improvement in the manufacture of doll arms of that class in which thin soft leather is used for a covering or case, and the latter stuffed with cotton, wool, or other similar or suitable material.]

45,692,—Device for Trimming Lamp Wick.—H. F. Bond, Waltham, Mass.:

I claim the lamp trimming device constructed and operated as herein set forth.

45,693.—Vise.—A. H. Brainard, Dorchester, Mass.:

I claim constructing the bed plate of the stationary jaw with grooves both upon the outside and inside, the outer grooves receiving the tongues of the movable jaw, which is thus guided and supported, the inner groove receiving and affording a firm hold for a bolt, which secures the vise in position, and also allows it to revolve upon a changeable centre or to slide to and fro, substantially as described.

I also claim the nut, g, substantially as described.

45,694.—Lubricator.—John Broughton, New York City:

I claim, first, The arrangement of the shank and spindle, B j, and cap, C, in combination with a detachable reservoir, substantially as described.

Second, Combining and arranging the detachable reservoir, the shank and spindle, B j, and cap, C, in such manner that the said shank and cap are held firmly and rigidly together independently of the reservoir, said reservoir being free to contract and expand independently of the connection between the shank and cap, substantially as described.

45,695.—Roller for Cotton Gins.—Israel F. Brown, New London, Conn.:

I claim, first, Making the drawing-in or working roller of a roller cotton gin with a surface partly solid and partly elastic, substantially as described.

Second, I also claim putting elastic bands or rings around the roller of a roller gin in parallel and in continuous or in interrupted lines, substantially as deseribed.

45,696.—Car Spring.—Andrew Buchanan, Brooklyn, N. Y.:

I claim, first, A spring for cars or other vehicles composed of two arms, each of which is supported at two or more points by blocks of india-rubber or other equivalent material, substantially in the manner and for the purpose herein shown and described.

Second, The set screw, f, in combination with the block, a, or its equivalent, and with the arms, A A, constructed and operating in the manner and for the purpose substantially as set forth.

Third, The toggle arms, C C, applied in combination with the arms, A A, and springs, a b b, in the manner and for the purpose substantially as specified.

45,597.—Propeller.—Jacob Bussier, Philadelphia, Pa.:

I claim the arrangement of the guides, frame, paddles, stays and levers, the whole being arranged to operate as herein set forth and for the purposes herein specified.

45,698.—Quartz Crusher.—Herman Camp, San Francisco, Cal. Ante-dated Sept. 17, 1863:

I claim the combination of the cylinder, A, and its peculiarly constructed head piece, B, with the dies constructed of a series of sections of cast iron, as shown in figures 3, 4, and 5, supported and revolving upon friction wheels. the whole made, constructed and operating in the manner and for the purpose herein described.

45,699.—Wagon and Carriage Brake.—Lewis C. Carpenter, Lancaster, Ohio. Ante-dated Aug. 19, 1862:

I claim arranging the lever, R, horizontally, and making the weight upon it roll or traverse on a bar, substantially as described for the purpose specified.

And in combination with the lever, R, and weight or roller, S, I claim the link, W, lever, N, and shaft, L, and roller, X, substantially as described.

45,700.—Cultivator.—A. B. Cass, Chicago, Ill.:

First, I claim the combination of the adjustable lever, A, bar, a, levers, b, and plows, M, arranged and operating substantially as and for the purposes set forth and shown,

Second, I claim attaching the scrapers, J, to the axle, by one or more arms, K, substantially as and for the purposes shown and set forth.

Third, I claim the combination of the adjustable lever, A, with the rod, L, provided with the arms, l, or their equivalent, and the chains, h, operating as and for the purposes shown and specified.

Fourth, I claim the employment of one or more rollers, H, to facilitate the lateral motion of the lever, A, operating substantially as shown and described.

Fifth, I claim the employment of the roller, I, in combination with the lever, A, arranged and operating substantially as and for the purposes herein shown and specified.

45,701.—Breech-loading Fire-arm.—Francis Clark, Auburn, Mass.:

First, I claim the combination of the hammer, G, cartridge extractor, b, hook, m, and retaining spring, h, substantially in the manner and for the purposes herein described.

Second, I also claim the combination of the cartridge extractor, as herein described, with the extended arm, g, so that it can be operated either from the front, by means of said arm, or from the rear by means of the hammer, substantially as herein described.

Third, I also claim the application to the hammer of the regulating screw, 3, in combination with the cartridge extractor, substantially as and for the purposes described.

44,702.—Saw Mill.—G. H. Clemens, U.S.A.:—

First, I claim the hinged knee adapted to be turned down out of the way, in the manner and for the purposes herein specified.

Second, I claim the provision of supporting wheels or rollers, F, set or capable of being set obliquely to the track, substantially as and for the objects set forth.

Third, I claim the wheels, F, journaled in pedestals, G, susceptible of angular adjustments beneath the carriage, as represented.

45,703.—Machine for Shearing Sheep.—M. C. Davis, Guilford, Ohio:

First, I claim two bars, J J', formed each of two parts, g g', connected together by swivel joints, h h, and the bars connected by a joint, I, which admits of them working in a direction at right angles with each other; in combination with the bar, K, to which the shears are attached, said bar being connected to the bar, J', by a joint, M, similar to I, and all arranged substantially as and for the purpose specified.

Second, The shears, composed of the fixed cutters, o o, and the vibrating knife, Q, attached to the outer or front end of bar, K, the knife being operated from the shaft, B, through the medium of the pulleys, F H N, cords or bolts. G O, crank, P, connecting rod, R, and arm, q, all arranged substantially as set forth.

[This invention relates to a new and improved sheep-shearing device of that class which are driven by power, that is to say, horse, steam, water, or other power than human, the shears being simply guided by the operator.]

45,704.—Mounting and Operating Ordnance.—James B. Eads, St. Louis, Mo.:

First, I claim the employment of the cylinders, E E, in combination with the racks, f f f' f', gears, g g g' g', and arms, h' h' h'' h'', or their substantial equivalents in effect, all being constructed and arranged to operate substantially as and for the purpose herein set forth.

Second, In combination with the other operative mechanical devices for operating the frame, H, I claim the adjustable capstan, R, substantially as and for the purposes set forth.

45,705.—Clod Crusher.—William Fenstermacher, Shippensburgh, Pa. Ante-dated March 7, 1864:

I claim the combination with the main frame, A, and arms or hangers C C and C' C' of the cylinder, E, provided with blades, G, and the rear smooth rollor, D, said parts being arranged and operating in relation to each other, as and for the purposes set forth.

45,706.—Apparatus for Aerating Dough.—Elisha Fitzgerald, New York City:

First, I claim supercharging the dough already aerated in the mixing receiver by forcing air or gas into it in the passage, K, at the time the faucet is opened to permit the exit of the dough.

Second, Forcing a jet of air or gas into the passage, K, at the time the dough is being expelled from the mixing receiver.

Third, Admitting the air or gas under pressure to come in contact and be infused in the dough in its passage out.

45,707.—Seeding Machine.—John M. Follett, Atkinson, Ill. Ante-dated May 14, 1862:

I claim the combination of the stopper slides, F, bar, G, and plow and coulter frame composed of the parallel bars, I, with the bars, l m, attached, the slides F, and plow and coulter frame being connected to the bar, G' and all arranged as shown to operate as set forth.

[The object of this invention is to obtain a machine of simple construction that will be capable of sowing seeds of various kinds and at the same time prepare the ground properly to receive it, the seed-stopper slides and plows being so connected that the distribution of the seed may be stopped and the plows elevated simultaneously by a simple manipulation of the attendant or driver.]

45,708.—Canceling Stamp.—John W. Foster, Washington, D. C.:

First, I claim a canceling stamp provided with an annular cutter, C, and an internal gage, B. either one or both adjustable in relation to each other, substantially as and for the purposes set forth.

Second, I claim the combination of the double set screws, E F, with the cutter, C, and gage, B, for the purpose specified.

45,709.—Crutch.—T. E. Gordon, Brooklyn, Ohio:

I claim the finger. g, stops, g', and springs, n, in combination with the tube, h, and crutch, when arranged and operating conjointly, as herein set forth.

45,710.—Picture Medals, Buttons. &c.—Henry C. Griggs, Waterbury, Conn.:

I claim the countersunk or perforated ring, b, in combination with the shell, a, for securing the picture in the manner specified.

I also claim a loop upon the edge of the shell, formed substantially as specified.

45,711.—Press.—G. E. Harding, Bath, Maine:

I claim the toggle levers, F, having their fulcra on pivots projecting from the ends of the follower and applied in combination with straps, G, and with a rope or chain extending from a windlass over pulleys in the loose ends of said levers and through loops or pulleys attached to said levers near their fulcra, thence over pulleys fixed to the frame and down to the fulcrum pins of the levers, substantially in the manner and for the purpose set forth.

Also the straps, G, hinged at one of their ends to the frame, A, and at their opposite ends to the loose ends of the levers, F, in combination with said levers, and with the follower and windlass, constructed and operating substantially as and for the purpose described.

[This invention relates to a press in which two toggle levers are connected to straps hinged to the frame and to the follower, and operated by a windlass. The rope from the windlass extends over pulleys in the arbor or lever ends of the toggle levers and along the upper edges of said levers, through loops or under sheaves near their fulcrum, up over sheaves fixed to the frame and down to straps secured to the rod which forms the moveable fulcrum of said toggle levers, in such a manner that a strain on the rope has a tendency to raise the follower and the inner ends of the toggle arms, and at the same time to draw their loose ends together, and the follower is exposed to a powerful upward pressure.]

45,712.—Shutter Bolt.—Daniel C. Heller, Reading, Pa.:

I claim the revolving button, C or C', bearing against inclined planes, d or d', cast on the case of the bolt, or on a bridge placed over the same and having its shank or pivot riveted in a sleeve, D or D', through which the bolt, B or B', passes all arranged substantially as and for the purpose herein set forth.

[This invention relates to an improved shutter bolt of that class which admits of the shutters being secured in a partially open as well as in a closed state.]

45,713.—Railway Coupling.—D. H. Hise, Salem, Ohio:

I claim the two bars, B B', one, B, provided with the key bolts, C C, and the other provided with holes, through which and holes in the rails the key bolts or tangs pass; in connection with the keys, D D, all arranged substantially as and for the purpose specified.

[The object of this invention is to obtain a coupling for railway rails which will hold the ends of the same in line with each other so as to avoid the injury now occasioned by the hammering of the car wheels against the projecting ends of the rails, a contingency which soon injures the rails and renders their removal for repairs necessary long before any other portion is materially affected by wear.]

45,714.—Snap Hook.—Henry Hise, Ottawa, Ill.:

I claim, as a new article of manufacture, the snap hook constructed and operating in the particular manner herein specified.

[This invention relates to a hook of that class which are provided with a snap and spring to close the hook and prevent it from becoming casually detached from the article with which it is engaged and at the same time admit of the article being readily engaged with or fitted into the hook, and disengaged from it when required.]

45,715.—Self-loading Hay Cart.—Erastus Holt, Wheaton, Ill.:

I claim the rake, N, having its bar, O, provided between arms, P P, which are attached by pivots to the sides of the body, A, of the cart, in combination with the shaft, F, cards or chains, h h, lever, K, and the arm, I, or its equivalent, all arranged substantially as and for the purpose herein set forth.

I further claim the bar, G, pivoted between the arms, E E, at the sides of the front end of the cart body, in combination with the arm, I, at the rear of the draught pole, H, and the bar, J, attached to shaft, F, all being arranged to operate in the manner substantially as and for the purpose specified.

45,716.—Molder's Sprue.—M. R. Howell, Elizabethport, N. J.:

I claim a molding sprue constructed with concave sides and curved ends, as above explained, as a new article of manufacture.

[This invention consists in certain improvements in the construction of "sprues" used by molders in their art, whereby the work is facilitated, better castings are made, and less metal is wasted than when the ordinary form of sprue is used.]

45,717.—Street Gas Lamp Posts.—J. T. P. Hunt, Manchester, N. H.:

I claim constructing a lamp post with an enlargement for the location of a gas meter, with a door and fastening, as described, as a new article of manufacture.

45,718.—Thread Guide for Spinning Machines.—E. D. Hurst, Lancaster. Pa.:

I claim the use of a glass cylinder introduced into the eye of metallic guides through a perforation made for that purpose, in the manner specified.

45,719.—Lamp.—Henry C. Hutchinson, Cayuga, N. Y. Ante-dated Sept. 12, 1863:

I claim the combination of the ratchet, A, or the shaft, F, with the circular or curved wick tube, B, and basin or chamber, C, as and for the purpose substantially as described.

45,720.—Attachment of Trains of Boats.—Walter Ingalls, Sanbornton, N. H. Ante-dated Sept. 12, 1863:

I claim the connecting or coupling of boats for navigation on rivers or canals into continuous lines or trains, by the means or mode substantially as herein described and set forth.

45,721.—Corn Planter.—Hiram Jordan, Milford, Ohio:

I claim the arrangement of conveying hopper, A, crescent shaped dropper, B, lever, C, rod, D, spring. E, shave, F G, and roller, H, the whole being combined and operating together in the manner specified.

45,722.—Pump.—Edmund B. Jucket, Pawtucket, R. I.:

I claim the combination of the cylinder and valve plates constructed independent of the outer can, substantially as and for the purpose specified.

45,723.—Roofing.—John W. Kingman, North Bridgewater, Mass.:

I claim the spring plate, c d, fastened as described, and covered with cloth, cemented or pasted thereon, substantially as specified.

45,724.—Lifting Dock.—Z. P. Leach, Danbury. Conn.:

I claim, first, The toggle levers, D, connected to each other by straps, E, or their equivalents, and operating in combination with the rising and falling beams, C, substantially as and for the purpose herein set forth,

Second, The supplementary beams, C', prinded with legs, b, and applied in combination with the main beams, C, and toggle levers, D, in the manner and for the purpose substantially as described

45,725.—Stump Extractor.—Hiram Lemm, Leonidas, Mich.:

I claim the combination of the parts involved in freeing the ratchet wheel, to wit, the lever bar, P O, bars, N, pawls, K, and segment wheel, Q, with the lowering brake levers, U S, and shoe, T, substantially as described and represented.

45,726.—Hay Loader.—Miles K. Lewis and John C. Durbin, Iowa City, Iowa:

We claim the combination of the transverse rod, j, lever, k, shaft, d, pulleys, c c, cords, e e, crossbar. g, with the rake, for the purpose of raising the rake with the gearing, a b, when the vehicle is backed to which the machine is connected.

We also claim the arrangement of the elevating belt of slats in connection with the rotating arms, P P, for joint operation, as and for the purpose described.

45,727.—Eyeletting Machine.—H. S. Lipman, Philadelphia, Pa.:

I claim, in combination with an eyelet machine, a die which makes a conical incision in the fabric for the reception of the eyelet with or without a central incision of a part, bearing the whole or a portion of the material to be embraced by the flange of the eyelet, substantially as shown and described.

45,728.—Cattle Stanchion.—Henry Maycock, Verona, N. Y.:

I claim the arrangement and combination of the lever, J, rope, K, operating on pulleys, P, and the sliding rail, L, when arranged and combined as herein described, for the purpose of operating the stanchions behind the cattle.

45,729.—Apparatus for Carburetting Gases.—S. T. McDougall, New York City:

I claim, first, The combination of a liquid or reservoir chamber, B, a reservoir, C, and a carburetting chamber, D, for the purpose herein specified.

I also claim the vessel, A, composed of a chamber, B, and a chamber, D, constructed and arranged substantially as and for the purposes herein set forth.

I also claim the construction and arrangement of the chamber, D, as provided with alternating close partitions, or divisions, 2 and 3, and intermediate fibrous, or capillary divisions, h i j, substantially as and for the purposes herein specified.

45,730.—Cultivator.—Daniel McNabb, Moscow, Mich.:

I claim constructing a cultivator or drill tooth with an upper curved portion, which curved part shall have a bearing against some rigid portion of the machine when it is in motion, so that the form

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of such curved portion of the tooth, and the position of the tooth, shall determine the amount of resistance which it may overcome without its being raised from the ground.

### 45,731.—Game.—B. E. Mead, Peekskill, N. Y.:

I claim, first, The construction of the holes, x x, in the walls, a b c d, in the manner and for the purpose, substantially as set forth.

Second, The making of marks, figures or indentations in the bottom of a box, in combination with figured holes in its sides for indicating the position of a marble at rest after being driven from one of the holes, in the manner and for the purpose substantially as set forth.

Third, The use of a flagstaff in combination with the holes in the sides of the box, in the manner and for the purpose substantially as set forth.

### 45,732.—Stovepipe.—David H. Metcalf and H. J. Shoemaker, Battlecreek, Mich.:

I claim, first, Adapting balanced dampers, b b, to operate partially when arranged at any desired point within the space formed by the two pipes, A B, substantially as desired.

Second, So constructing and arranging the dampers, b b, within a space formed by the two pipes, A B, that when these dampers are fully open they will be supported in this condition by the two pipes. A B, substantially as described.

### 45,733.—Car Coupling.—Loring Moody, Malden, Mass. :

I claim the combination of the separate curved pin, C, with the tripping lever, B, and the recessed bunter far, A.

I also claim the combination of the separate curved pin, C, and its holding mechanism, viz.. the spring, D, and notch, f, or their mechanical equivalent or equivalents with the tripping lever, B, and the recessed bunter bar, A, the whole being substantially as described.

I also claim the combination of the slot, h, or its mechanical equivalent, with the tripping lever, its curved pin and the recessed bunter bar, the said slot being arranged in manner and for the purpose set forth.

### 45,734.—Mode of Constructing Frames for Portable Houses.—Jacob Morgan, Dundee, Ohio :

I claim a portable sawmill frame constructed and arranged with braces and tightening rods, substantially as herein specified.

### 45,735.—Ditching and Mole Plow.—E. H. Morton, Oxford, Iowa :

I claim, first, Attaching the sweep, E, to the capstan, B, by means of the journal, c, and slotted bar, D, on the latter, and the eye, d, on the sweep, substantially as and for the purpose set forth.

Second, In combination with the sweep, E, the adjustable bail support, G, constructed and applied to the capstan frame, A, to operate as and for the purpose described.

Third, The securing of the coulter, K, to the beam, H, through the medium of the slot, a, and adjustable plates, J J', arranged substantially as herein set forth.

[This invention relates to a new and improved plow of that class which are commonly termed mole plows, and are used for forming subterranean drains,]

### 45,736.—Machine for Condensing Pap or Slops of Clay for Potter's use.—Joseph Muir, New York City :

I claim, first, The whirling vessel having imperforated sides impermeable to water and inclining inward or with a rim at the top and combined with mechanism for rotating it, substantially as described and substantially for the purposes hereinbefore set forth, and with the draw-off pipe, h, or its equivalent, in combination with the whirling chamber.

Second, I claim securing the whirling vessel to the rotating mechanism by means of a disk or platform, e, and the screw bolts, g, and g', or their equivalents, for the purpose of conveniently attaching or removing the whirling vessel.

### 45,737.—Process of Preparing Clay for Potter's Use.—Joseph Muir, New York City :

I claim, as my improvement in the process of preparing clays for potters' use or for the market, the above described improved mode of condensing the pap or slops of clay by subjecting the slops in proper quantities to the action of centrifugal force in a whirling vessel having imperforate and impermeable sides, substantially as described, whereby the clay, by reason of its adhesiveness and greater specific gravity, is condensed and separated from the water to the desired extent, without recourse to straining, by which a portion of the clay is lost and adheres to the sides of the vessel from which it may be removed in a plastic state for potters' use, or to be prepared in the usual manner for the market as potters' clay.

### 45,738.—Hand Punches.—William Nash, Watertown, N. Y. :

I claim, first, A hand punch for cutting leather, paper, metals and other materials, wherein the punch lever is independent of the movable arm of the handle of the punch, but is operated by the toe thereof as by a free lever not connected with the punch lever by any joint or hinge, substantially as above described.

Second, I also claim the combination with a hand punch of any adjustable gage, i, substantially as and for the purpose above set forth.

### 45,739.—Steam Boiler.—John E. Neill, Brooklyn, N. Y.:

I claim incasing a portion of the tubes of a tubular steam boiler, substantially as herein described, so that such casing shall extend on one side to the steam chamber of the boiler to receive steam generated in the boiler and conduct it to the tubes so incased, to be thereby superheated, and on the other side communicate with the outside of the boiler to carry off the steam after it has been superheated substantially as described.

I also claim combining with superheating tubes, or the equivalents thereof, a water tube or tubes or the equivalent thereof, for the protection of the tubes or flues of a superheater against the intense heat of the products of combustion, by causing such products to act first on the surfaces protected by water, substantially as herein described.

### 45,740.—Grain Screen.—Harrison Ogborn, Richmond, Ind. :

I claim the cam wheel, J, and lever, K, in combination with the riddle, G, screen, I, and adjusting straps, E, the several parts being constructed, arranged and operating substantially as and for the purpose set forth.

### 45,741.—Lumber Measure.—A. M. Olds, Chicago, Ill.:

I claim, first, A lumber measure arranged substantially as described, so that with a measuring disk of uniform diameter the superficial feet of boards of different lengths can be determined.

Second, The nest of wheels, f f' f'', etc., applied in combination with the disk, A, sliding shaft, h, and index hands, c d, substantially as and for the purpose set forth.

Third, The shoe, p, in combination with the measuring disk, A, constructed and operating substantially as and for the purpose described.

[The object of this invention is to produce a lumber measure which, with a measuring disk of uniform diameter, is capable of indicating the number of superficial feet contained in boards of different lengths.]

### 45,742.—Cutter Stock.—John Peace.—Camden, N. J. :

I claim, as a new article of manufacture, a cutter stock constructed as herein shown and described.

[This invention relates to a new and improved cutter stock for cutting screws on gas and other pipes, and it consists in the employment of double cutters fitted in a stock peculiarly constructed, whereby the cutters may be readily adjusted, and either end used to operate upon pipes of different diameters, and the cutters accurately adjusted to suit the diameter of the pipe to be acted upon.]

### 45,743.—Sausage Filler.—John G. Perry, South Kingston, R. I.:

I claim the construction of the nozzle, s, and cylinder or case, A, with the piston head and rack, B, constructed substantially as herein described and for the purpose set forth.

### 45,744.—Meat Cutter.—John G. Perry, South Kingston, R. I.:

First, I claim the combination of the knives, x x x, with the plates, S, constructed substantially as described and for the purpose set forth.

Second, I claim the combination of the knives and plates, S, with the case, A, and shaft, B, substantially as herein described and for the purposes set forth.]

### 45,745.—Stovepipe Elbow.—J. G. Perry, South Kingston, R. I. :

First, I claim as a new article of manufacture a cast-iron stovepipe elbow made in two parts and having one end made small enough to receive the pipe on the outside and the other end large enough to receive the pipe on the inside, with the projections or fastenings, when constructed substantially as herein set forth and for the purpose specified.

Second, I claim the combination of the damper with the two parts of the elbow, substantially as herein described and for the purposes set forth.

### 45,746.—Machine for Cutting Soap.—J. G. Perry, South Kingston, R. I.:

I claim the combination of the wire, R, lever, B, and box, A, substantially as herein described and for the purpose set forth.

### 45,747.—Window-sash Supporter.—J. G. Perry, South Kingston, R. I.:

I claim the combination of the two cams or curved levers, with the projections, o c, constructed substantially as herein described and for the purpose set forth.

### 45,748.—Boot and Shoe Last.—John C. Plumer, M. D. Portland, Maine :

I claim, first, In the construction of a shoe last, the transverse inclined planes, L G, and Y Y, as described, in combination with the prominences, G L, as described.

Second, The form and location of the prominences, G L, as described.

Third, The form and location of the concavity, D D D D, as described.

Fourth, The combination of the planes, concavities and prominences, as described.

### 45,749.—Fan Blower.—Rufus Porter, Malden, Mass.:

I claim the regulator, I J K L M N, in combination with the cams, A B, in box, c, all combined for the purpose herein specified.

### 45,750.—Cultivator Gang Plow.—T. T. Prosser and M. C. Darling, Chicago, Ill., and K. A. Darling of Fond du Lac, Wis.:

First, We claim guiding and regulating the movement of the tongue, D, by means of the pulley, H, chain, F, eye bolts, G, attached to the side frame, A, and levers, H, substantially as described.

Second, Connecting the pair of draft arms, B B, without regard to the number of pairs used to the forward main cross bar of the frame, A, by means of the double nutted screw bolt, L L, and which forms with the plates, M M, a hinge or other joint, so that whilst the said bars shall have a free vertical motion, they may be adjusted laterally without being detached or removed from the said crossbar.

Third, Constructing a cultivator or gang plow, so that the interval between the shank, N N, which supports the plow shares, may be increased or diminished without removing the shaft bars, B B, or their connections, from the main crossbar of the frame, A, when each pair of shaft bars are capable of lateral adjustment, independent of the other pair or pairs.

Fourth, The combination of lever, T, rods and polls, U U, operating the ratchet wheel, S, upon the roller, O, for elevating simultaneously the several plows of the gang or gangs, substantially as set forth.

### 45,751.—Meat and Vegetable Slicer.—G. B. Pullinger. Germantown, Pa.:

I claim, first, The adjustable rotating gage plate, D, as described and for the above purpose.

Second, I claim the scoring knives, c c c, in combination with the rotating gage plate, as described and for the above purpose.

Third, I claim the slotted stay, r, for securely holding the end of the cutter, C, as above described and for the purpose specified.

Fourth, I claim the frictional feed motion, as constructed, and operated as described for the above purpose.

### 45,752.—Self-oiling Spindle Bolster for Spinning Frames —W. T. Rippon and Thos. R. Robinson, Providence, R. I.:

We claim, first, The oil chamber composed of a socket tube with collars or flanges, d e, applied in combination with the oil chamber, b, formed within the rail, substantially as herein specified.

Second, The washer or gasket, D, arranged within the oil chamber and the nut, C, applied to a screw thread on the bolster below the rail, the whole combined substantially as and for the purpose specified.

### 45,753.—Instrument for Determining the Variation of the Compass.—E. S. Ritchie, Brookline, Mass. :

I claim the construction of the rotary compass cord, A, the separate supporting index plate, c, the rotary bar, D, provided with sights or their equivalents, the clamp, F, and the index pointer, G, or its equivalent, the whole being arranged and applied substantially as specified.

And in combination therewith I claim the divided limb, H, and the auxiliary sight index, I.

### 44,754.—Press.—Charles H. Robinson, Bath, Maine :

I claim the levers, D D, attached to the platten or follower, c, in combination with the swinging arms, E E, and the ropes, O G, all being arranged and applied to operate in the manner substantially as and for the purpose herein set forth.

[This invention relates to a new and improved press for baling, and it consists in a novel arrangement of levers applied to the follower or platten, in such a manner as to render the press very compact and also very efficient in its operation.]

### 45,755.—Water Wheel.—Joel Sanford, Polo, Ill.:

I claim a water wheel constructed with buckets, C, each formed of three arcs, described from the several centers, d f' a', all as herein shown and described.]

[This invention relates to a new and improved horizontal water wheel, and it consists in a novel construction of the buckets, whereby it is believed that a large percentage of the power of the water is obtained.]

### 45,756.—Steam Engine.—Daniel Sexton, San Gabriel Cal. :

I claim, first, The two pistons, D D', connected together by the bar, E, and operating in open cylinders A A', in combination with the abutment, C, valve, H H*, and ports, d d* d' d*', in the manner and for the purpose substantially as herein shown and described.

Second, The lever, F, and sheds, a a', in combination with the pistons, G, and valves, H H*, constructed and operating substantially as and for the purpose set forth.

Third, Hinging the lever, F, as and for the purpose specified.

### 45,757.—Ore Separator.—Edward L. Seymour, of New York City. Ante-dated Dec. 3, 1862 :

I claim the combination of trunk or cylinder, G, with the movable drawer, F, for the purpose of separating and separately delivering the refuse and the concentrated portion of each separate charge, as described.

I also claim, in combination with the cylinder, G, the air pipe, V, as described, and for the purpose described.

I also claim the combination of the exhausting apparatus, A, or its equivalent, with the movable box, F, with or without the cylinder, G, as described, and for the purposes described.

### 45,758.—Cultivators.—Lyman Sherwood, of Marine, Ill.:

I claim, first, The arrangement of the frame, A A' A', with its teeth or plows, c c, in combination with the rollers, B B, all being constructed and arranged to operate, substantially as and for the purposes set forth.

Second, I claim the arrangement of the pole, E, with reference to the frame, A, and standard, f, substantially as and for the purposes set forth.

### 45,759.—Car Seats of Railway Cars.—Edwin F. Shoenberger, of Philadelphia, Pa.:

I claim the bar, L, and its teeth, in combination with the cog wheel, f, so connected to the backs of the whole row of seats that one back cannot be moved without disturbing the whole, as set forth for the purpose specified.

### 45,760.—Grates for Furnaces.—William H. Short, of Brooklyn, E. D., N. Y. Ante-dated Aug. 19, 1863 :

I claim the combination and arrangement of the grate bars, B, so as to form spaces, c, between their inner ends in the middle of the grate, A, and the beveled shoulder of the adjoining bars, substantially as and for the purpose herein shown and described.

[The invention consists in the arrangement of spaces between the inner ends of divided grate bars, their outer ends being held in place by hooks catching over the front plate and over the bridge wall, or over bars connected with or attached to said plate and wall, in such a manner that each grate bar can expand and contract without impediment or obstruction, and consequently said bars are not liable to injure the structure of the wall in which the boiler is set, neither are they liable to bend or break by the expansion.]

### 45,761.—Ash Cart.—Robert A. Smith, of Philadelphia, Pa. Ante-dated July 21, 1863 :

I claim a cart having a receptacle composed of permanent side, D, and permanent ends, D', and the tilting of dumping box, G, hung or secured to a shaft, F, and constructed and applied to the permanent portion of the receptacle, substantially as and for the purpose herein set forth.

### 45,762.—Process of Preserving Organic Substances.—J. Galusha Staunton, of Buffalo, N. Y. Ante-dated April 3, 1862 :

I claim the method of preserving fruits, vegetables, and the like, by means of forming an external crust, shell or covering of paraffine in contact with the body of the fruit or thing to be preserved, substantially as described.

### 45,763.—Vessels for Preserving Butter and other substances.—J. Galusha Staunton, of Buffalo, N. Y. Ante-dated April 3, 1862 :

I claim as a new article of manufacture a box, can or vessel, for preserving fruit, vegetables, meat, butter, spices and the like, constructed of wood and made air tight by an internal lining or enamel of paraffine or equivalent, substantially as described.

### 45,764.—Cases for Preserving Animal and Vegetable Substances during Transportation.—J. Galusha Staunton, of Buffalo, N. Y. Ante-dated May 5, 1863 :

I claim, first, A transportation case, having a plurality of walls, substantially as described, in combination with a distinct ice chest in connection therewith, for the purposes set forth.

Second, A skeleton framework of wood covered with leather, cloth, rubber or other equivalent materials, in a manner to form a plurality of walls, which spaces may be filled with cotton, wool or other poor conductor of heat, or dead air, for the purpose and substantially as described.

Third, An ice chest, made separately from a transportation case, and so combined and connected to the outside of the case that a free communication of air from the ice to the interior case is secured, substantially as set forth.

### 45,765.—Preserving Fruit, Meat, Fish, Etc.—J. Galusha Staunton, of Buffalo N. Y. Ante-dated May 18, 1863 :

I claim the substitution of hydro-carbon gas, in the place of air in the cans or vessels in which fruit or other substances may be inclosed for preservation, for the purposes and substantially as above set forth.

### 45,766.—Air-tight Boxes, Cases, Etc.—J. Galusha Staunton, of Buffalo, N. Y. Ante-dated May 18, 1863 :

I claim the application and use of a thread or welt of rubber throughout the joints of wooden or board packages, for the purpose and substantially as described.

I also claim coating or lining the inside of such wooden packages with paraffine, warp, gum, or other impervious substance, in combination with the welted joint, for the purpose and substantially as described.

### 45,767.—Device for Spreading Manure.—James H. Stevens, of East Durham, N. Y.:

I claim, first, The two ropes, d d', with the shaft, F, for operating the apron, D, and admitting of the same being moved back when the load is discharged.

Second, The semi-conical screw, K, at the rear of the wagon, when used in connection with a manure-discharging device, for the purpose set forth.

Third, The discharging fork, I, arranged to operate substantially as herein described, in connection with the apron, D, or its equivalent, for the purpose set forth.

[This invention consists in applying to a wagon a movable bottom, composed of an apron, which works on friction rollers, and using in connection with a movable bottom a fork arranged and operated in such a manner as to discharge the manure evenly or uniformly from the wagon as the former is presented or fed to the fork by the movable bottom. The invention further consists in the employment or use of a semi-conical screen, attached to the rear of the wagon, for the purpose of receiving the manure as it is discharged by the fork, and insuring a uniform distribution of the same upon the field.]

### 45,768.—Process for Preparing Refuse Wool for Use.—Leonard T. Stiastny, of Hoboken, N. J.:

I claim the treatment of the wool as described, by applying to it in connection with the treatment of it by an acid solution, as described, but prior thereto, steam, in the manner substantially as set forth.

I also claim in connection with the treatment of wool by an acid solution, as described, and after the said treatment is completed, the application of a high degree of heat to the wool during the drying process, for the purpose of burning the vegetable parts which may still adhere to said wool, substantially as described.

### 45,769,—Horse Rakes.—Joshua C. Stoddard, of Worcester, Mass.:

I claim the operating of the rake to enable it to discharge its load and to bring it back to a working position by means of the adjustable shaft, M, pinion, P, having the cam, R, attached to its inner side, composed of a circular rim, e, with two recesses, f f, the fixed roller, g, wheel, Q, and lever, O, with spring, d, all arranged and combined to operate in the manner substantially as described.

[This invention relates to a new and useful improvement in means for operating the rake, so that the latter may be held in proper position to its work, and readily raised when necessary in order to have its load discharged.]

### 45,770.—Combination of Pen Rack, Calendar and Letter Balance.—Horatio N. Taft, of Washington, D. C. Ante-dated Nov. 27, 1864 :

I claim the calendar, constructed and arranged substantially as described, and its combination with the pen rack.

I also claim the combination of the calendar with a balance or weighing scale, and also the combination of the letter balance with a pen rack, as set forth.

### 45,771.—Method of Securing Barrel Heads.—Joseph T. Tomkins, of New York City. Ante-dated Nov. 24, 1861 :

I claim the use of the piece, A, substantially in the manner and for the purposes described.

### 45,772.—Grain Separators.—B. T. Trimmer, of Rochester, N. Y.:

I claim combining the shoe, D, and fan case, E', in one body, thereby dispensing with an outer casing, substantially as herein set forth.

I also claim supporting the shoe, D, and fan case, E, combined in one body, on the fan shaft, a, by means of the cams or cranks, k, and in such a manner as to impart a universal vibration, substantially as herein specified.

### 45,773.—Caster for Furniture.—Alfred Walker, of New Haven, Conn.:

I claim a combination of vertical and horizontal grooves, with or without the rest, e, with a pin to traverse the same, substantially as is herein described.

### 45,774.—Blasting Fuse.—Thomas H. Walton, of Ashland, Pa.:

I claim the safety-blasting fuse, constructed substantially as above set forth.

[This fuse is intended as a substitute for the metal barrel fuse, the flexible fuse and other kinds, and it is made by plowing a narrow groove in a strip of wood, in which is laid a train of gunpowder or common fuse, and the train covered by any suitable water-proof material.]

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### 45,775.—Broadcast Seeding Machines.—George W. Warren, of Ossian, N. Y.:

I claim the jointed bar, G, provided with the arm, p, in combination with the harrow, C, standard, m, shaft, H, and frame, A, the whole so arranged that while the draught is applied centrally to the harrow the latter is prevented from overturning, substantially as herein set forth.

### 45,776.—Combined Spur-Carrier, Boot-Drawer and Pantaloon Guard.—Egbert P. Watson, of New York City:

I claim a metallic plate, constructed substantially as above described, so that it can be attached by springs or screws to the heel of a boot, for the object hereinbefore specified.

### 45,777.—Sewing Machines.—Wm. Weitling, of New York City:

First, I claim the combination in a sewing mechanism of one or more revolving thread leaders and their supports, with the adjustable frame of the cloth presser, so that all of them may be raised and lowered by the same mechanism, substantially as and for the purposes set forth.

Second, I also claim supporting the bobbins which supply the revolving double thread carrier on a revolving table, for the purpose of preventing the threads from twisting before reaching the double thread carrier, substantially as and for the purposes described.

Third, I claim a feeding device, feeding the fabric by the action of a chisel-edged pad against the inclined under surface of an upper reciprocating pad or cloth pressure, thus operating by a pinching and direct angular pressure instead of by vertical pressure, substantially as and for the purposes set forth.

Fourth, I also claim the combination of the levers, F, and toggle arms, G, with the needle bar, C, and thread guide, g, constituting my thread-dellvering regulator, substantially as and for the purposes described.

Fifth, I also claim the application to a sewing mechanism of the turning table, H', upon the bed plate, A, serving as a support to the fabric, and having the needle as the center of motion, when said table is suspended to the needle arm, substantially as and for the purposes described.

Sixth, I also claim securing the guide pins, O, to the adjustable frame, F, of the cloth presser, so that they can be raised and lowered together with said cloth presser, substantially as and for the purposes described.

I also claim a feeding device, with smooth surfaces, operating by the angular motion of two parts acting on each other, and thus gripping the fabric between them and moving it forward, substantially as described.

### 45,778.—Railroad Cars.—R. T. M. Wells, of Franklin Centre, Vt.:

I claim the loose pulley, D, with draft chain, I, attached, in connection with the ratchet, E, attached permanently to the axle, C, and the pawl, F, placed within the pulley, to operate in the manner substantially as and for the purpose set forth.

I also claim the eccentrics, G G, in connection with the rod, b, passing through the pawl, F, all arranged as shown, to free the pawl from the ratchet when the pulley is thrown back, as herein described.

I also claim the coil spring, H, in combination with the pulley, D, ratchet, E, and pawl, F, arranged substantially as and for the purpose specified.

I further claim the stops, g g, attached to the eccentrics, G G, when used in connection with the pulley, D, spring, H, pawl, F, and ratchet, E, for the purposes set forth.

### 45,779.—Converting Rotary into Reciprocating Motion.—P. Werni, of Manchester, Mich.:

I claim the employment of inclined planes, a d, and spring, e, in combination with the double rack, A, and pinion, B, constructed and operating substantially as and for the purpose set forth.

[This invention relates to an improvement in that class of devices for converting rotary into reciprocating motion, in which a pinion is used which has its teeth cut away on one-half of its circumference, and which gears alternately in the upper and then in the lower edge of a double rack, so that by imparting to said pinion a rotating motion the double rack assumes a reciprocating rectilinear motion.]

### 45,780.—Garment Measuring.—John B. West, of New York. Ante-dated Sept. 8, 1862:

I claim using instruments substantially such as specified, or their equivalents, upon or against the specified parts of the body, in such manner that right angles or corners are formed by them at the points where they cross or intersect each other and from the sizes and forms thus ascertained may be readily drawn by running in from a perpendicular line, producing a bust of the measured body upon cloth, which bust used in connection with certain measures herein indicated, taken from the body, but not embraced in the bust, and with the ordinary graduated tape, serves as a guide or basis from which to draft with certainty a garment the size and shape of the body measured as set forth

### 45,781.—Buttons.—Elonzo S. Wheeler, of Westford, Conn.:

I claim the combination of the two washers or discs with the hollow shank and the button, substantially as and for the purposes described.

### 45,782.—Cultivator.—Thomas Wiles and James McGinnis, of Muscatine, Iowa:

I claim the combination of the rising and falling or vertically-adjustable plows, O, with the rising and falling and laterally-adjustable plows, I, when the latter are pivoted to shafts, D D, and connected to the shafts, P, so as to rise simultaneously with the plows, V, on the turning of the shait, P, as and for the purpose herein set forth.

[This invention relates to a new and useful improvement in that class of cultivators in which the plows that work by the sides of the rows of plants are capable of being adjusted laterally, in order that they may conform to the sinuosities of the rows.]

### 45,783.—Stove.—William Wheeler, of Poultney, Vt.:

I claim the employment of the spherically-shaped fire-potor chamber of combustion, B, or its equivalent, with numerous small apertures, b, in the upper surface thereof, in the manner and for the purposes substantially as herein described and set forth.

I also claim the employment of the contracted and oblong throat, D, and the narrow circular flues or throats, D D, in the manner and for the purposes substantially as herein described and set forth.

I also claim the combination of the said throats or flues, D, with the said fire-pot or combustion chamber, B, and with the heating or radiating chamber, c, substantialiy as and for the purpose herein described and set forth.

### 45,784.—Window Sash Suspenders.—John H. Williams, of Oakland, Cal.:

I claim the arrangement and combination of the pulley plates, M M, grooves, L L, plate hooks, B B, and slotted bar, H, substantially as described, for the purpose set forth.

### 45,785.—Machine for Drawing Bolts by Hydraulic Pressure.—Seth Wilmarth, of Boston, Mass.:

I claim a bolt-drawing machine, consisting of a vice or jaws for grasping the bolt, in combination with a hydraulic lift for withdrawing the same, operating substantially in the manner herein set forth.

### 45,786.—Steam-Pressure Gages.—Edwin A. Wood, of Utica, N. Y.:

I claim the combination of the disks, A and B, or the ring, D, or their equivalents, constructed and operating substantially as described, for the uses and purposes.

### 45,787.—Coffee Pots.—Hiram Young, of New York City. Ante-dated Dec. 11, 1861:

I claim the combination of the two strainers, E F, tube, C, and faucet, B, arranged with the body, A, substantially as and for the purposes set forth.

I further claim constructing the top or cover, G, of the coffee pot, with an opening at its apex to admit of the inserting of the top and its attachments to the tube, C, to serve the purposes of a funnel, as described.

[This invention relates to a coffee pot of that class in which the coffee is made by leaching or percolating, and consists in so arranging certain parts that the hot water will be forced upward through the ground coffee, and then again passed down through it before being drawn for use, thereby causing the extraction of all the strength from the coffee, and by a very simple arrangement of means.]

### 45,788.—Meat Cutter.—Wm. G. Bell (assignor to Wm. G. Bell & Co.), of Boston, Mass.:

I claim, first, The employment or use of a movable guide, I, in combination with the cutter head, F, substantially as and for the purpose set forth.

Second, The endless screw, M, and worm wheel, N, applied in combination with the center pin, C, bridge, B, and block, D, in the manner and for the purpose substantially as described.

### 45,789.—Spring Gun.—John E. Blythe, of New York City, assignor to M. Vedder and Henry S. Myers. Ante-dated May 2, 1862:

I claim the use and application to guns and pistols of one or more revolving concave rollers or pulleys, upon or around which India-rubber or other elastic material is made to pass, thus securing an additional length of stretch or propelling force in a given space, increasing in proportion to the number of rollers used; also, the combination of India-rubber in guns and pistols, with slide-roller and groove, as described.

### 45,790.—Machines for Cutting Chair Splints.—Thomas N. Davey (assignor to himself and Thomas Davey, Sr.), of Jeffersonville, Ind.:

I claim the reciprocating bed, B, provided with the dogs, c c' c'' c''', in combination with the endless belt, C, with pin or stud, g, attached, and the slotted bar E, at the under side of the bed in which the pin or stud works, substantially as and for the purpose specified.

Second, The beam, J, with adjustable blocks, K K, attached, the latter provided with the vertical sliding blocks, L, having cutter bar or stocks, M, secured to them by hinges, q, when said parts are used in connection with a reciprocating bed, B, as and for the purpose specified.

Third, The means employed for automatically feeding the beam, J, downward, to wit: the bent arm, b', rod, S, rock arm, R, pawl, a', and ratchet, b, in connection with the projection, a, on the bed, E, all arranged substantially as set forth.

Fourth, The knives, N N', attached to the bars or stocks, M, in connection with the guard plates, O, substantially as and for the purpose specified.

[This invention relates to a new and useful machine for cutting splints for chair bottoms, and for other or similar purposes. The object of the invention is to supersede the slow and laborious process of manufacturing splints by hand, by producing a superior article in an expeditious manner.]

### 55,791.—Manufacture of Paper Stock.—William Delton, (assignor to himself, Chas. W. Baker, James M. Sheehan, Michael Tooney, Lawrence R. Fitzgerald and James T. Derrickson), of New York City:

I claim, first, The tank, a, partitioned off at b, and provided with the perforated steam pipes, e e, for the purpose and as specified.

Second, I claim boiling the vegetable fiber in the vegetable caustic alkaline solution, when said vegetable material is sustained by a perforated bottom above heating pipes, as set forth.

Third, I claim the treatment of vegetable fiber by an alkaline solution prepared in the manner and of the material set forth.

### 45,792.—Drop Presses.—Henry C. Gladding, of Providence, R. I., assignor to himself, W. Coleman & Sons, and Joseph Ralph. Ante-dated June 20, 1863:

First, I claim the combination and arangement as set forth of the friction pulley, D, and the winding pulley, G, with the strap of a drop hammer, substantially as herein described, for the purpose specified.

Second, In combination with a suitable device for elevating a drop or hammer to any desired hight at will, a spring force suitably arranged, acting with sufficient swiftness to take up any slackness in the lifting strap occasioned by the rebound of the hammer, substantially as herein shown and described, for the purpose specified.

Third, In combination with the lifting strap of a drop hammer, a break or stop, having a nipping or binding action, conveniently arranged, with a hand lever or other suitable device, and operating substantially as herein shown and described, for the purpose specified.

Fourth, I claim the peculiar manner herein shown and described of securing the guides to the anvil to effect the purpose set forth.

Fifth, I claim constructing one of the guides with a movable piece, substantially as herein shown and described, for the purpose specified.

Sixth, I claim the peculiar construction and arrangement herein shown and described of the hubs or heads, S S S S, to effect the purpose set forth.

Seventh, I claim, in combination with the anvil and die of a drop press, the sliding punches and percumine lever, K, arranged and operating substantially as herein shown and described for the purpose specified

### 45,793.—Process of Preparing Grain for Distillation.—Joseph Fleischman, of New York City, assignor to himself and Aloes Fleischman, of Olmutz, Austria:

I claim the use of the method or process hereinbefore described of treating or preparing India corn and other cereals in the manufacture of alcohol and spirits, as an improvement upon Aloes Fleischman's patent of July 12, 1864, for a like purpose.

### 55,794.—Inkstands.—Franklin L. Hicks (assignor to Benjamin and Phineas Lawrence), of New York City:

I claim the combination of the elastic bottom of the inkstand with the turning rod and cam for the purpose and as specified.

### 45,795.—Perpetual Calendars.—Henry W. Holly (assignor to himself and John T. Fanning), of Norwich, Conn.:

I claim the use of the rollers, A B, marked as described, and applied to a common axle, C, which has its bearings in suitable lugs rising from a paper weight or in a pen rack or other similar article, in the manner and for the purpose substantially as set forth.

[The object of this invention is a perpetual calendar, which can be readily attached to a paper weight, pen rack, or other similar article, used on or about a writing desk.]

### 45,796.—Fanning Mills and Grain Separators.—Harrison Ogborn, of Richmond, Ind., assignor to himself and Almond T. Chapin. of Paw Paw, Mich.:

First, I claim the rocking support, K, adapted to transmit motion to the shoe, E, in the manner explained, and constituting a medium for preventing the existence of a counter current of air, thus increasing the efficiency of the operating current.

Second, I claim supporting the shoe at its rear end by means of arms, O, provided with elliptical or oblong apertures, o, fitting over screws or bolts, having elongated heads, o', which admit of the ready adjustment of the arms, O, as and for the purpose explained.

Third, I claim the strip or flexible attachment, P, for giving a vertical motion to the screw, I, simultaneously with its reciprocating movement. substantially as described.

Fourth, I claim the bearings, I2, when curved in such a way as to allow the arms, i', which they support to be readily removed for adjustment, while preventing their accidental displacement, as herein set forth.

Fifth, I claim the combined screw and grain board, D D', arranged and employed in the manner and for the purposes specified.

Sixth, I claim the deflectors or guides, J J, for regulating the fan blast, when the same are pivoted directly to the main frame of the machine (in contradistinction to being pivoted to the shoe) and adjusted by means of the catches, j, and holes, a, in the manner and for the purpose explained.

Seventh, In combination with the doors, Q, of the fan case, I claim the slotted bar, R r, and pins or projections, q q, arranged to operate substantially as and for the purpose described.

Eighth, I claim the circular distributor, C2, employed to prevent the grain from accumulating at the center of the screw, D, substantially as and for the object specified.

Ninth, I claim the grooves, d' d', in combination with the flange, f, of the screw, F, said groove and flange admitting of the formation of a continuous conducter for the grain in both positions of the box, D D' D'', substantially as explained,

### 45,797.—Breech-loading Fire-arms.—Joseph Rider, of Newark, Ohio, assignor to himself and E. Remington, of Ilion, N. Y.:

I claim, first, The combination of the hammer, tumbler and swinging breech piece operating together, as and for the purpose substantially as described and represented.

I also claim, in combination with the tumbler, breech piece and sear, the sear guard, e, e, operating therewith, as and for the purpose substantially as described and represented.

### 45,798.—Reaping and Mowing Machines.—Thomas Swan, of Manlius, N. Y., assignor to himself. E. B. Alvord. A. W. Field, and James Coburne, of Syracuse, N. Y.:

I claim, first, The wheel, D, provided with teeth, e, carved at one side, as shown at I, in combination with two pallets, E E', connected by the rod, F, all arranged to operate substantially as and for the purpose herein set forth.

Second, The rock shaft, J, provided with the pendant arm, K, and operated through the medium of the arbor, I, and arm, G, when said parts are used in combination with the wheel, D, pallets, E E', and rod, F, and all arranged in the manner substantially as and for the purpose set forth.

The elastic bumpers, N N, in connection with the vibrating arm, K, substantially as and for the purpose herein specified,

[This invention relates to a new and improved means for operating the sickle, whereby a rapid movement or stroke is given the latter, and an even or uniform motion obtained without the jars and concussions and consequent wear and tear which attend the use of the ordinary crank. The invention also possesses the advantage of being very compact, and capable of being applied at a small expense, it being composed of but few parts.]

### 45,799.—Pumps.—Mary P. Walters, administratrix of W. E. Waters, deceased, of East Bend, Ky., assignor to Aquila H. Pickering, of Salem. Iowa:

In combination with the hollow piston shaft, G, cylinder, A, and side passage or pipe, B, I claim a piston, E, so constructed that the water in both the up and down stroke will be forced centrally through the piston into the tubular shaft, G, substantially as described.

I also claim providing the piston, E, with the independent port frames, I I', and the valve, K, moving between them, so as alternately to close each in the upward and downward strokes, substantially as herein specified.

I also claim the special construction and arrangement of the piston as a whole, the same being provided with the induction passages, i i, ports, I I, valve, K, and angular space, l, substantially as described

In combination with the pump cylinder, A, side passage or pipe, B, and valves, g g' f f', I also claim the elongated passage, D, opening on one side, upward by the mouth, h, substantially as and for the purpose herein set forth.

### 45,800.—Musical Instrument.—George Woods, Cambridge, Mass., assignor to Mason & Hamlin, Boston, Mass.:

I claim, first, The wire coupler, K, running diagonally from key to key of any chord, having bent arms, as described, one of which is operated upon by the key played. while the other operates the other key, under a mode of construction substantially as above set forth.

Second, I also claim the movable disconnected fulcrum bar, h, constructed and operated substantially as described, to effect the construction and disconnection of the couples with the keys, as above set forth.

[This invention consists in a coupling device of a peculiar and novel construction, by which keys of thirds, fifths, octaves, and other notes, can be coupled together so as to be played by the depression of only one of the keys, by means of a movable fulcrum and connections ]

### 45,801.—Breech-loading Fire-arm.—Cosme Garcia Saez, Madrid, Spain:

First, I claim forming the breech chamber, as described, of one piece divided in the rear, so as to admit of contraction or expansion by the application of a suitable tightening device, as set forth.

Second, In combination with an expansible breech chamber I claim a new and actuating lever, constructed and arranged for operation for rendering the parts of the breech gas tight, as set forth.

### 45,802.—Bolting Mill.—Edouard H. Vittecoq, Beaumontel, France:

I claim the construction and arrangement of bolting mills, substantially as set forth, for operation in the manner and for the purpose described.

### 45,803.—Method of Desulphurizing and Oxydizing Metallic Ores.—M. B. Mason (assignor to C. V. De Forest, Amos Howes and Geo. Van Derburgh), New York City:

I claim my improved process for removing sulphur, arsenic, phosphorus and antimony from auriferous or other metallic ores, and for oxydi ing the said ores, by treatment of them with hydrogen and carbonic acid gases, substantially in the manner herein set forth.

I claim, also, as a part of my improved process, the admission of steam into the chamber wherein the metallic ores are heated, desulphurized and oxydized, substantially in the manner and for the purpose herein set forth

### 45,804.—Furnace for Desulphurizing and Treating Auriferous and other Metallic Ores.—M. B. Mason (assignor to C. V. De Forest, Amos Howes and Geo. Van Derburgh), New York City:

I claim, first, A fire chamber for generating gases by the decomposition of steam therein, substantially as described, arranged in combination with a separate chamber for containing and treating metallic ores, substantially in the manner and for the purpose herein set forth.

Second, The generation of gases by the decomposition of superheated steam within a suitable fire chamber, when said gases and like products of combustion in this fire chamber are conducted into and through a separate chamber containing metallic ores, for the purpose of desulphurizing and oxydizing said ores, substantially as herein set forth.

Third, When a fire chamber for generating gases is combined with a separate chamber for treating ores substantially as hereinbefore described, I claim the introduction and use of steam in said ore chamber, for the purpose of preventing excessive heat therein, substantially as herein set forth.

## RE-ISSUES.

### 1,844.—Apparatus for Leaching Tan Bark and Preparing Extracts.—W. H. Allen and Otis Warren, Fryeburgh, Maine, assignees of said W. H. Allen. Patented July 26 1862:

First, I claim the process herein described, of leaching bark or extracting the soluble ingredients from substances containing the same by the application to the bark or other substance of the leaching or solving liquid, in the manner hereinbefore set forth, distributing the said liquid in fine streams or spray evenly over the surface and letting it percolate into and through the mass of bark or substance until it shall become duly saturated, and keeping up the supply of liquid, as set forth, until the said bark or substance shall be exhausted, substantially as specified.

Second, I claim the herein described apparatus for leaching bark or for extracting the soluble matter from solid substances containing the same, that is to say the combination with a vat or tub of suitable form, of a false bottom and rotating distributing arm, the whole being constructed for operation, substantially as set forth.

Third, Proportioning the areas of the apertures in the rotatory distributing arm to the distance of each from its center of revolution, so that a uniform quantity of liquid shall be distributed over and through the mass, substantially in the manner set forth.

### 1,845.—Treating Leather.—E. H. Ashcroft, J. A. Johnson and A. S. Moore (assignees by mesne assignments of Joseph Burrill), Lynn, Mass. Patented May 3, 1864:

We claim, first, The use of gelatine in the treatment of leather after it is tanned for the purpose of improving its quality.

Second, The combination of gelatine with a solution of hemlock bark, or other substance containing tannin, and alum, substantially as described and for the purpose set forth.

### 1,846.—Rowlock.—J. W. Norcross, Middletown, Conn. Patented Sept. 27, 1864:

I claim, first, The use of a plate or bracket, D, with center pin, b, applied in combination with a rowlock, B, and with the gunwale of a boat, substantially as and for the purpose set forth.

Second, The flange, C, and bracket, D, either one being provided with a rim overlapping the edge of the other and applied in combination with a rowlock, B, of any desirable construction, substantially as and for the purpose described.

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Third, The spring, c, applied in combination with the rowlock, B, in the manner and for the purpose substantially as shown and described.

1,847.—Preparing Barrels to Contain Petroleum, Coal Oil, etc.—Louis S. Robbins, New York City. Patented May 3, 1864 :

I claim the combination formed by saturating the entire surface of the cask with oil, and the inner body of the staves and heads with an akaline solution or with soapsuds, substantially as and for the purpose set forth.

I also claim saturating the staves and heads of the casks with a strong alkaline solution or with soapsuds, as and for the purposes above specified.

# PATENTS

GRANTED

FOR SEVENTEEN YEARS.

**MUNN & COMPANY,**

In connection with the publication of [the SCIENTIFIC AMERICAN, have acted as Solicitors and Attorneys for procuring "Letters Patent" for *new inventions* in the United States and in all foreign countries during the past *seventeen years*. Statistics show that nearly ONE-THIRD of all the applications made for patents in the United States are solicited through this office ; while nearly THREE-FOURTHS of all the patents taken in foreign countries are procured through the same source. It is almost needless to add that, after *seventeen years'* experience in preparing specifications and drawings for the United States Patent Office, the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office ; but they take pleasure in presenting the annexed testimonials from the three last ex-Commissioners of Patents.

MESSRS. MUNN & Co.:—I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours very truly,

CHAS. MASON.

Judge Mason was succeeded by that eminent patriot and statesman, Hon. Joseph Holt, whose administration of the Patent Office was so distinguished that, upon the death of Gov. Brown, he was appointed to the office of Postmaster-General of the United States. Soon after entering upon his new duties, in March, 1859, he addressed to us the following very gratifying letter.

MESSRS. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents, while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and I doubt not justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant,

J. HOLT.

Hon. Wm. D. Bishop, late Member of Congress from Connecticut, succeeded Mr. Holt as Commissioner of Patents. Upon resigning the office he wrote to us as follows:

MESSRS. MUNN & Co.:—It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency; and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully, your obedient servant,

WM. D BISHOP.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent, free of charge. Address MUNN & CO., No. 37 Park Row, New York.

As an evidence of the confidence reposed in their Agency by inventors throughout the country, Messrs. MUNN & CO. would state that they have acted as agents for more than TWENTY THOUSAND inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of inventors and patentees, at home and abroad. Thousands of inventors for whom they have taken out patents have addressed to them most flattering testimonials for the services rendered them; and the wealth which has inured to the individuals whose patents were secured through this office, and afterwards illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! Messrs. MUNN & CO. would state that they never had a more efficient corps of Draughtsmen and Specification Writers than those employed at present in their extensive offices, and that they are prepared to attend to patent business of all kinds in the quickest time and on the most liberal terms.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service which Messrs. MUNN & CO. render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there; but is an opinion based upon what knowledge they may acquire of a similar invention from the records in their Home Office. But for a fee of $5, accompanied with a model, or drawing and description, they have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through the Branch Office of Messrs. MUNN & CO., corner of F and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office, and it is a very wise course for every inventor to pursue. Address MUNN & CO., No 37 Park Row, New York.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention if susceptible of one; or, if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The best way to remit money is by a draft on New York, payable to the order of Messrs. MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents ; but, if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row New York.

Patents are now granted for SEVENTEEN years, and the Government fee required on filing an application for a patent is $15. Other changes in the fees are also made as follows :—

| | |
|---|---|
| On filing each Caveat | $10 |
| On filing each application for a Patent, except for a design. | $15 |
| On issuing each original Patent | $20 |
| On appeal to Commissioner of Patents | $20 |
| On application for Re-issue | $30 |
| On application for Extension of Patent | $50 |
| On granting the Extension | $50 |
| On filing a Disclaimer | $10 |
| On filing application for Design (three and a half years) | $10 |
| On filing application for Design (seven years) | $15 |
| On filing application for Design (fourteen years) | $30 |

The Patent Laws, enacted by Congress on the 2d of March, 1861 are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish and all other foreigners, except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms. Foreigners cannot secure their invention by filing a caveat ; to citizens only is this privilege accorded.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention. The Government fee for a caveat is $10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

REJECTED APPLICATIONS.

Messrs. MUNN & CO. are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of their Washington Agency to the Patent Office affords them rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Their success in the prosecution of rejected cases has been very great. The principal portion of their charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted, are invited to correspond with MUNN & CO., on the subject giving a brief history of the case, inclosing the official letters, &c.

FOREIGN PATTENS.

Messrs. MUNN & CO., are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business they have offices at Nos. 66 Chancery lane London ; 29 Boulevard St. Martin, Paris ; and 26 Rue des Eperonniers, Brussels. They think they can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through their agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through MUNN & CO'S Agency, the requirements of different Government Patent Offices, &c. may be had, gratis, upon application at the principal office, No. 37 Park Row, New York, or any of the branch offices.

SEARCHES OF THE RECORDS.

Having access to all the official records at Washington, pertaining to the sale and transfer of patents, MESSRS. MUNN & CO., are at all times ready to make examinations as to titles, ownership, or assignments of patents. Fees moderate.

INVITATION TO INVENTORS.

Inventors who come to New York should not fail to pay a visit to the extensive offices of MUNN & CO. They will find a large collection of models (several hundred) of various inventions, which will afford them much interest. The whole establishment is one of great interest to inventors, and is undoubtedly the most spacious and best arranged in the world.

MUNN & CO. wish it to be distinctly understood that they do not speculate or traffic in patents, under any circumstances ; but that they devote their whole time and energies to the interests of their clients.

COPIES OF PATENT CLAIMS.

MESSRS. MUNN & CO., having access to all the patents granted since the rebuilding of the Patent Office, after the fire of 1836, can furnish the claims of any patent granted since that date, for $1.

EXTENSION OF PATENTS.

Many valuable patents are annually expiring which might readily be extended, and if extended, might prove the source of wealth to their fortunate possessors. Messrs. MUNN & CO. are persuaded that very many patents are suffered to expire without any effort at extension, owing to want of proper information on the part of the patentees, their relatives or assigns, as to the law and the mode of procedure in order to obtain a renewed grant. Some of the most valuable grants now existing are *extended patents*. Patentees, or, if deceased, their heirs, may apply for the extension of patents, but should give ninety days' notice of their intention.

Patents may be extended and preliminary advice obtained, by consulting, or writing to, MUNN & CO., No. 37 Park Row, New York.

ASSIGNMENTS OF PATENTS.

The assignment of patents, and agreements between patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park Row, New York.

UNCLAIMED MODELS.

Parties sending models to this office on which they decide not to apply for Letters Patent and which they wish preserved, will please to order them returned as early as possible. We cannot engage to retain models more than one year after their receipt, owing to their vast accumulation, and our lack of storage room. Parties, therefore, who wish to preserve their models should order them returned within one year after sending them to us, to insure their obtaining them. In case an application has been made for a patent the model is in deposit at the Patent office, and cannot be withdrawn.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid) should be addressed to MUNN & CO. No. 37 Park Row, New York.


# Notes and Queries

D. A., of Conn.—We do not know what the patent extract of quilliag is. The "Industrial Chemist" came for a while regularly to this office, but we have not seen a copy for some time, and suppose that it has gone the way of most weekly papers.

J. J., of N. Y.—It has recently been stated in the SCIENTIFIC AMERICAN that the process of making grape sugar from starch is an old and established industry. But it is claimed that Mr. Goessling has discovered the art of making cane sugar from starch, and if this be true it is a very important discovery.

E. S. C., of Florida.— The regular differences in squares, roots, logarithms and other series of numbers, have been most laboriously examined by Babbage and others, as they form the basis for the construction of calculating machines.

W. C. S., of Ohio.--Smee's Electro-Metallurgy, published by John Wiley, 535 Broadway, New York, is an excellent treatise.

H. S., of N. Y.—The induction of magnetism in soft iron occupies an extremely minute, but appreciable period of time, and it takes time also in losing its magnetism. If your bar magnet were revolved in the circle of soft wires, it would be held back by the magnetism lingering in the wire that it was leaving, while there would not be an equal force yet generated in the wire that it was approaching.

C. H. B., of Pa.—You can make a good soft solder for patterns of tin and lead in the following proportions:—tin, 8 pounds; lead, 5. If the patterns fuse or melt with this, make them a little harder, or don't apply the iron too hot. We do not know of any cold solder for this purpose.

J. C. G., of N. Y.—If we understand your question, you have an air-tight tank filled with water and connected by a pipe with an empty air-tight boiler beneath; and you want to know whether the water will run from the tank down into the boiler. If the pipe is large enough for the air to pass up at the same time that the water is passing down, the water will run down; but if the pipe is so long that the end of it will be covered by the water rising in the boiler, the flow will cease.

## Money Received

At the Scientific American Office, on account of Patent Office business, from Wednesday, Dec. 28, 1864, to Wednesday, Jan. 4, 1865:—

A. M., of N. Y., $25; H. H. M., of N. Y., $25 O. R. B., of N. Y., $25; E. A. H., of Del., $15; H. B. B., of Mass., $30; S. & G., of R. I. $15; J. H. P., of Mich., $25; Mrs. J. P., of Mich., $25; S. & Co., of Wis., $25; B. H., of Ill., $16; J. C. W., of Mich., $25; W. H. H. of N. Y., $15; W. F., of Conn , $26; A. M., of N. H., $16; J. A. L., of N. Y., $45; G. N. B., of Mich., $40; E. H. C., of Mich., $20; L. S. F., of N. J., $45; J. P. C., of Pa., $20; J. S. U., of N. Y., $45; R. B., of N. Y., $15; F. S. P., of N. Y., $22; F. G. S., of Mass., $20; T. M. of N. Y., $20; J. J. A., of N. Y., $15; J. A. McP., of N. Y., $20; S. O. R. of N. Y., $15; P. P., of N. Y., $20; H. B., of N. J., $30; A. M. W., of Mass., $22; C. F., of N. Y., $30; B. F., of N. Y., $12; J. B., of N. Y., $12; H. H. P., of Ill., $25; J. G. P., of Penn., $25; T G. L., of R. I., $25; S. M. F. R., of Ill., $15; T. C., of Ohio, $41; J. C. G., of N. J., $80; H. H., of N. Y., $15; J. P. E., of Ohio, $16; M. P., of N. H., $20; H. K., of Penn., $16; R. B. of N. Y., $250; F. S., of Italy, $45; L. S., of Penn., $20; J. L. C., of N. Y., $15; S. R., of Penn., $20; T & S., of N. Y., $40; W. S. N., of Conn., $20; C. M. J., of N. Y., $45; J. A. M., of Conn., $20; T. S. & W., of N. Y., $22; H. A. R., of N. Y., $15, E. M., of Ill., $20; S. G., of N. Y., $20; M. H., of Mass., $20; T. S. & W., of N. Y., $59; L. T., of N. Y., $20; E. C., of N. Y., $25; W. H., of N. Y., $25; J. W., of N. J., $15; C. H. P., of N. Y., $25; T. B. R., of Mich., $15; C. F. K., of Penn., $24; McK. & R., of Penn., $25; W. A., of Ohio, $25; C. M. G. R., of N. Y., $25; W. H. C., of Me., $15; J. B. T., of N. Y., $40; T. R., of Ill., $20; G. A. C., of Mass., $10; J. W. P., of Mo., $15; P. W. K., of Ill., $45; O. W., of Conn., $15; A. W. O., of Mich., $20; B. & P., of Mo., $20; F. H., of Ill., $40; O. R. B., of N. Y., $40; F. J., of N. Y., $20; H. D. F., of Mass., $10; D. C. S., of N. Y., $20; J. H., of Ill., $20; J. W. F., of Ill., $20; C. H. of Wis., $20; E. H., of Ind., $20; J. H., of N. Y., $45; L. A., of Conn., $30.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it, and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, stating the amount and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office, from Wednesday, Dec. 28, 1864, to Wednesday, Jan. 4, 1864:—

A. M., of N. Y.; C. F., of N. Y.; E. C., of N. Y.; B. F., of N. Y.; H. H. W., of N. Y.; W. H., of N. Y.; O. R. B., of N. Y.; J. B. of N. Y.; F. S. P., of N. Y.; McK. & R., of Pa.; J. H. P., of Mich.; G. G. P., of Penn.; C. H. P., of N. Y.; H. H. P., of Ill.; H. B. B., of Ms.; T. W. E., of Mich.; W. A., of Ohio; E. W. S., of Wis.; H. H., of N Y.; O. M. & G. R., of N. Y.; G. D., of N. Y.; M. P., of N. H.; W. F. of Conn.

## Back Numbers and Volumes of the "Scientific American."

VOLUMES III., IV., VII., X., AND XI., (NEW SERIES) complete (bound) may be had at this office and from periodical dealers. Price, bound, $3 00 per volume, by mail, $3 75 which includes postage. Every mechanic, inventor or artisan in the United States should have a complete set of this publication for reference Subscribers should not fail to preserve their numbers for binding. VOLS. I., II., V., VI., VIII. and IX., are out of print and cannot be supplied.

BINDING.—Those of our subscribers who wish to preserve their numbers of the SCIENTIFIC AMERICAN for future reference, can have them substantially bound in heavy board sides, covered with marbled paper, and leather backs and tips, for $1,00 per volume.

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## RATES OF ADVERTISING.

TWENTY-FIVE CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published we will explain that eight words average one line. Engravings will not be admitted into our advertising columns, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.


BAIRD'S CATALOGUE OF PRACTICAL AND SCIENTIFIC BOOKS, complete to Dec. 15, 1864, sent free of postage to any one who will send his address to HENRY CAREY BAIRD, Industrial Publisher, No. 406 Walnut street, Philadelphia. 1

COMSTOCK'S ROTARY SPADER.—HAVING DISposed of the right to manufacture and vend Comstock's Rotary Spader throughout the United States, except the New England and other Atlantic and Pacific States, we are now prepared to issue licenses to manufacture and vend this implement upon the basis of a license fee of ten per cent of gross sales of machines made and sold to parties who will advance in cash the following sums, to be reimbursed from said per centage:—For the New England States, $5,000; for the State of New York, $6,000; for the State of New Jersey, $3,000; for the State of Maryland, $2 000; for the State of Delaware, $1,000; for the State of California, $10,000; for the State of Oregon, $3,000; or, for the whole to one party, $25,000.

We would call the attention of Manufacturers, Capitalists, and persons forming Joint Stock Companies, who may wish to secure a good thing cheap, to the following facts:—

The merits of the invention have been fully proven.

With it the preparation of the soil for seed is expedited, cheapened and improved.

It is capable of being constructed of any size, from one-horse power upward.

It is peculiarly well adapted to the application of steam power.

Sample machines can be had of J. C. BIDWELL Esq., Pittsburgh, Pa.

Address COMSTOCK & GLIDDEN, Milwaukee, Wis., or C. COMSTOCK, care of J. C. Bidwell, Esq., Pittsburgh, Pa. 3 4*

IMPORTANT TO WOOLEN MANUFACTURERS AND YARN SPINNERS.—Greenwood's Patent Reciprocating Rotary Motion. An improvement in spinning wool and other similar fibers. Warranted to make yarn of a more even size, and requiring 20 per cent less twist. Is in operation in Camden Woolen Mills, New Jersey. State Rights for sale (all except Pennsylvania), or the whole patent will be disposed of. For further information address GREENWOOD BROTHERS, Camden Woolen Mills, N. J. 3 2

BAIRD'S CATALOGUE OF PRACTICAL AND SCIENTIFIC BOOKS, complete to Dec. 15, 1864, sent free of postage to any one who will send his address to HENRY CAREY BAIRD, Industrial Publisher, No. 406 Walnut street, Philadelphia. 1


## PROPOSALS FOR ICE.

MEDICAL PURVEYOR'S OFFICE, WASHINGTON, D. C.

Sealed Proposals will be received at this Office until January 25, 1865, for furnishing ICE to the Medical Department of the Army, at the points herein designated. The ice to be stored by the contractor in properly-constructed ice houses at each point of delivery, on or before the 15th of April next; the ice not to be receipted for until its quality, the fitness of the ice-house, and the manner in which it is packed shall have been approved by a medical officer, and payment will be made only for the amount thus actually stored and receipted for.

The proposals will be made for the quantities indicated below as required at the respective places, with the proviso that should more be needed at any time for the year's supply, it shall be furnished at the same rates and under the same conditions.

QUANTITY TO BE DELIVERED AT

| | |
|---|---|
| Annapolis, Md., ice-house, owned by the United States | 150 tuns. |
| Point Lookout, Md., ice-house owned by the United States | 200 tuns. |
| Fortress Monroe, Va., ice-house owned by the United States | 280 tuns. |
| Portsmouth, Va., ice-house not owned by the United States | 100 tuns. |
| Newbern, N. C., ice-house not owned by the United States | 400 tuns. |
| Hilton Head, S. C., ice-house owned by the United States | 450 tuns. |
| Beaufort, S. C., ice-house owned by the United States | 300 tuns. |
| Savannah, Ga., ice-house not owned by the United States | 400 tuns. |
| Pensacola, Fla., ice-house not owned by the United States | 100 tuns. |
| Mobile Bay, Ala., ice-house not owned by the United States | 100 tuns. |
| New Orleans, La., ice-house owned by the United States | 500 tuns. |

Proposals will also be received for furnishing Ice, daily by weight, for the year 1865—in such quantities as may be required by the Surgeons in charge—at United States General Hospitals, at the places enumerated above, and upon the following annual estimate, in and near:—

| | |
|---|---|
| Boston, Mass | 10 tuns. |
| Portsmouth Grove, R. I | 130 tuns. |
| New Haven, Conn | 60 tuns. |
| New York | 800 tuns. |
| Newark, N. J | 100 tuns. |
| Philadelphia, Pa | 1,300 tuns. |
| Baltimore, Md | 500 tuns. |
| Frederick, Md | 75 tuns. |
| Washington, D. C | 2,500 tuns. |

All additional amounts that may be required at these places until January 1, 1866, are to be furnished at the same rates.

FORM OF PROPOSAL.

The undersigned proposes to furnish —— tuns of first quality Ice, carefully packed in substantial ice-houses, at the within-named points, namely: ——, ——, ——, ——, ——, at the following price per tun of two thousand pounds, namely: at —— —— —— —— —— tuns, at $—— per tun.

The Ice to be subject to the inspection, measurement and approval of a Medical Officer, or other properly-appointed inspector, before being receipted for.

Payment to be made from time to time upon duplicate bills certified to by the Medical Director.

(Signed) ——. ——.

FORM OF PROPOSAL.

The undersigned proposes to furnish daily, or otherwise, all the Ice required for the hospitals, upon approved requisitions of Surgeons in charge, at or near the within-named points, at the following price per hundred pounds, namely: —— —— —— —— —— $—— cents per hundred pounds.

The Ice shall be of the best quality, and subject to the approval of the Surgeon in charge, who shall receipt for the actual amount delivered at each hospital.

Payment to be made from time to time upon duplicate bills, certified to by the Medical Director.

(Signed) ——. ——.

The above form of proposals will be adhered to as closely as practicable. Other forms will be received by the Department and duly considered.

A proper guarantee that the bidder is able to fulfil the contract, certified to by the Clerk of the nearest District Court, or a United States District Attorney, must accompany the proposal, or it will be rejected.

An oath of allegiance to the United States Government must also accompany the proposal.

The contracts will be awarded to the lowest responsible party or parties, who will be duly notified by mail or otherwise that their bid is accepted, and immediately required to enter into contract under bonds to the amount of $5,000. The bonds must be properly certified, and the post-office address of principals and sureties stated upon them.

Bidders may be present in person when the proposals are opened.

The post-office address of the parties proposing must be distinctly written upon the proposal.

Proposals must be addressed to "Surgeon Charles Sutherland, U. S. Army, Medical Purveyor, Washington, D. C."

The Department reserves the right to reject any and all bids deemed unsuitable.

CHARLES SUTHERLAND,
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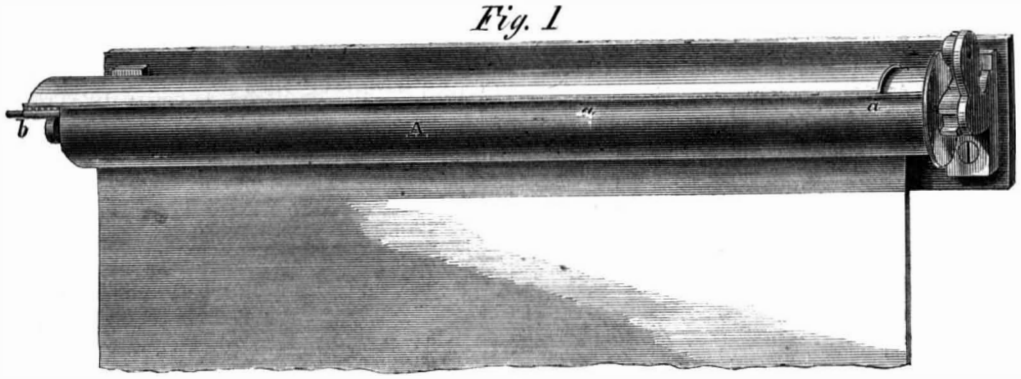
### Improved Curtain Fixtures.

Very great annoyance has been caused by the common cord-and-roller fixtures for curtains, and the catch over which the cord passes at the bottom. This slide is very insecure, and constantly getting ont of order. Its appearance is also objectionable in many places. The fixtures herewith illustrated have no side catch to get out of repair, and are self operating so far as rolling up the curtain is concerned. They are simple in principle, and the model before us works very well; they will doubtless give satisfaction wherever introduced. The following description will render the details intelligible to our readers.

The roller on which the curtain is fastened is a tin tube, A, having a spring, B, see fig. 3, coiled inside.

*Fig. 1*



HARTSHORN'S CURTAIN FIXTURES.

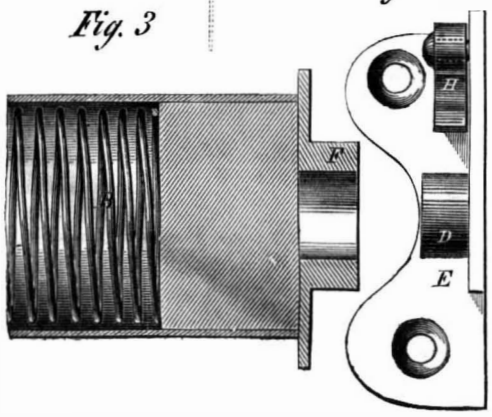
Fig. 1 shows this tube and also the manner of fastening the curtain to it. A groove is made in the roller, which has a thin flange, a, overlapping it. The edge or top seam of the curtain is then wired as at *b*, placed in the groove, and the flange turned over it, where it is firmly held in its place.

The end of the roller is hollow and fits over a journal, D, cast on the bracket, E. The roller has further a boss, F, see fig, 2, on the end, in which there are recesses, G. In these latter the pawl, H, fits, its other end being jointed to the bracket.

*Fig. 2*

*Fig. 4*

*Fig. 3*




The operation of these details is as follows: When the curtain is rolled up, by grasping the tassel usually placed on the bottom it may be pulled down to any point; the pawl, H, falls into the recess on the roller and holds it in place. When it is desired to elevate the curtain, a slight pull causes the pawl to slip out of the recess, and the spring, B, then exerts orce, and winds the curtain upon the roller. It is therefore possible to fix the shade at any hight and retain it there without the use of cords or catches on the window frame. A patent was procured on this arrangement through the agency of the Scientific American Patent Agency, Oct. 11th, 1864, by Stewart Hartshorn; for further information address him at N. W. corner of Fourth avenue and Tenth street, New York City.

### Utilising Refuse Tin.

Some improvements in treating and utilising refuse tinned iron and other combined metals has been provisionally specified by Mr. N. O. Andre, of Paris. He proposes to subject the cuttings to the action of nitrous or nitric vapors, or any other gaseous acids, with a view to the re-employment of the metals, especially tin, such scraps forming the refuse of various existing manufactures or products. The metal refuse is first poured into a vertical column from five to ten yards in hight, and of a size proportionate to the amount of products to be treated. This column is divided into compartments of about fifteen inches in depth by means of wood divisions moving in a horizontal plane. The metal is put in at the top of the column, care being taken to introduce the wood divisions above each compartment when filled, so that the total weight of the metal shall not rest on the bottom but be divided into as many fractional parts as there are compartments. The acid vapors are then introduced at the lower part of the column (nitrous vapors for example), and on the other hand steam is introduced at the same point, which becoming partially condensed renders humid the substances contained in the column. The gaseous acids oxidise the surface of the refuse metal and ultimately attack the iron, and this action is allowed to continue in order to ensure the oxidation of all the foreign metals, and when the operation has sufficiently advanced the bottom compartment of the chamber is emptied, and the divisions above mentioned successively withdrawn from the bottom upwards, so as to empty the contents of each compartment into the next below it which has become vacant, while the upper one is charged with a fresh quantity of materials. The refuse, which is now covered with a pasty oxide, is washed in several waters and sorted, while if there be any oxide still adhering it is again washed in acidulated water and then rinsed. The sorting is effected with greater or less care according to the purpose for which these cleaned iron scraps are intended. The acids are reduced and melted in a crucible enveloped in charcoal in the ordinary manner. In order to obtain the tin in a perfectly pure state the oxide is washed in nitric and acetic acids. If the metal scraps have been treated by means of the vapors of hydrochloric acid with a view to obtain the whole or part of the tin in the state of protochloride or bichloride it may be precipitated in a metallic state by means of zinc. The iron scraps or solder which may have been imperfectly deprived of tin or other metal are introduced a second time into the column, or they may be employed in chemical operations where the presence of small quantities of lead or tin is not prejudicial.—*London Mining Journal.*

CARE OF THE HEALTH.—"A man had better break a bone, or even lose a limb, than shake his nervous system. Lord Coke requires only eight hours' application per day, for a student of the law, and Sir Matthew Hale thought six as much as any one could bear; eight, he said, was too much."

### A Plan for Accelerating the Speed of Paddle Steamers.

A foreign contemporary says: A series of experiments have recently been made with a working model, fitted with a pair of two-bladed screws or fans, working amidships in the place of ordinary paddles, with results of 60 per cent in favor of the fans with the boat empty, and 30 per cent when heavily laden with stone. The same boat was employed in testing the two powers, by removing the paddles from the axles and putting the fans in their places. Mr. George Ellis is the inventor.

[It is very curious to see how inventions repeat themselves, and what extraordinary results are obtained in experiments that vanish in practice. The same plan was tried here on Lake Erie and the Hudson River some years ago but was a total failure, as any engineer could have predicted.—EDS.

THE new gunboat Suwanee, built by Redney, Son & Archer, at Chester, Pennsylvania, on her trial trip, on Friday, made sixteen miles in fifty-five minutes, or about eighteen knots an hour. She is a "double-ender."

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